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A SCIENTIFIC QUARTERLY DEALING WITH EXTRASENSORY PERCEPTION, THE PSYCHOKINETIC EFFECT, AND RELATED TOPICS

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The Journal *of* Parapsychology

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A PK EXPERIMENT WITH DIE FACES AS TARGETS

By H. FORWALD

ABSTRACT: Previous experiments by the author have been concerned with the placement experiments in which he attempted, by mental action, to cause electrically released cubes to stop in a specified area of a dice table. Highly significant results were obtained in these experiments. The new research reported here was carried out with the objective of finding out whether the subject could also succeed when trying to make a certain target face of the die turn up. The over-all results were highly significant, and the effect of dice bias was controlled by making an equal number of die-throws for each of the six faces. There were four different physical conditions: dice measuring 5 mm. to a side and dice measuring 13 mm. to a side were hand-thrown onto a hard surface and onto a soft one. The small dice thrown onto the hard surface gave the greatest deviation—more than twice that produced in any of the other three conditions. The small cubes on the hard surface appeared to the author to bounce to a far greater degree. The large deviation in this case, therefore, provides evidence against the unconscious use of muscular skill to control the dice. These findings, the writer suggests, might indicate that PK action is continuous during the entire die movement, resulting ultimately in bringing the die to rest with the target face on top. Contrasting position effects related to the experimental design and procedure were found in the first and second halves of the experiment.—Ed.

INTRODUCTION

THE AUTHOR'S previous reports on his experiments in psychokinesis have all been concerned with research on the placement of moving cubes (2). However, the experimental evidence for PK rests primarily upon the results of tests by a number of investigators in which subjects were attempting to influence how dice fell with respect to designated target faces (1). It was felt some time ago, therefore, that it would be valuable, for a survey of PK results on a broader basis, to conduct also some series with ordinary playing dice to see what the results would be when using die faces as targets.

An experiment with faces as targets was carried out during December, 1956, through February, 1957, and in January and February, 1960, and the results are reported here. It was decided in this experiment to vary the physical conditions, specifically the cube size and the hardness of the throwing surface.

Ordinary dice with faces 1 to 6 were used. Four series were carried out concurrently during each experimental period with two different sizes of dice which were thrown by hand onto surfaces of two different kinds, a hard one and a soft one. The dice were plastic, one kind measuring 5 mm. along each edge and the other kind measuring 13 mm. Three 5 mm. dice were thrown simultaneously twice in succession for the specified face, whereas in the series with 13 mm. dice, two such dice were thrown three times in succession. Thus the number of trials was six in both cases. We may designate these six trials as the experimental *unit*. The "chance" number of hits is one per unit when using each face as target an equal number of times in a long series. (The use of different numbers of large and small dice was a matter solely of convenience.)

The target sequence throughout was from Face 1 to Face 6 in succession in 1956-57 and from 6-1 in 1960. We designate this sequence of trials for the six faces as the *set*. It comprises $6 \times 6 = 36$ trials. A *session* consisted of six such sets, or 216 trials. In each period of experimentation there were 36 sessions in each of the four series, making a total of 7,776 trials per series, or 31,104 trials in all for the four series.

The "soft" throwing surface consisted of a thick, soft cardboard sheet, with a consistency much like that of blotting-paper, placed on a table. The "hard" surface was the surface of a polished table, on which the small dice especially made quite a lot of bouncing movements before coming to rest. The throwing surface was in each instance enclosed on three sides by rows of thick books, preventing the cubes from falling onto the floor. The area of the throwing surface was about two by three feet.

The eight series have been designated Series F1-F8. The conditions in the different series were the following:

Series F1 and F5: Two 13 mm. dice thrown on the soft surface,
Series F2 and F6: Three 5 mm. dice thrown on the hard surface,

Series F3 and F7: Three 5 mm. dice thrown on the soft surface,
Series F4 and F8: Two 13 mm. dice thrown on the hard surface.

The four series F5-F8 done in January-February, 1960, involved the same dice and the same conditions as F1-F4 carried out in 1956-57, with the single exception that in 1960 the faces were used as the target sequence in descending order (6 to 1) instead of the order 1 to 6.

Results

The results will be presented first for the two periods of experimentation separately and then in combination.

The total trials and the deviations from the chance number of hits in the four series in 1956-57 and for all four series combined are given in Table 1, together with the critical ratios and probability values.

Table 1
General Results
(1956-57 Data)

Series	No. Trials	Dev.	CR	P
F1	7776	+ 49	1.49	0.14
F2	7776	+123	3.75	0.0002
F3	7776	+ 36	1.10	0.28
F4	7776	+ 56	1.71	0.085
Total	31104	+264	4.02	0.00007

The results are significant for Series F2 where three small dice were thrown on the hard surface, and also for the total data of all four series.

Rather pronounced position effects are found when comparing the deviations from chance expectation for the faces 1 to 6 in each of the four series, and these effects are even more striking in the total data (see Table 2). A chi-square test of the distribution of hits and misses among the six targets yields $\chi^2 = 71.25$ (5 d.f.), with $P < 10^{-6}$. Thus the observed number of hits were not randomly distributed among the six faces (or throwing positions) in the set. The high positive score on the 1-face is primarily responsible for this,

Table 2

DEVIATIONS FROM CHANCE EXPECTATION FOR TARGET FACES
(1956-57 Data)

Series	FACE						Total
	1	2	3	4	5	6	
F1.....	+ 52	+16	−31	−13	+ 2	+23	+ 49
F2.....	+ 98	− 4	+16	+33	−22	+ 2	+123
F3.....	+ 41	+18	+ 1	+18	−14	−28	+ 36
F4.....	+ 54	+14	−14	−12	− 3	+17	+ 56
Total....	+245	+44	−28	+26	−37	+14	+264

accounting for practically the whole deviation in the 1956-57 results. In this connection it should be remembered that each set was started with Face 1 as the target. This pronounced effect in the first unit in the set seems similar to the beginning salience observed in the PK placement experiments of the author, where outstanding results have as a rule been obtained in the first of the five positions in the set (2).

In comparing the deviations for different faces as targets, we naturally have to consider whether dice bias brings any uncertainty into the probability calculations. But it seems that we would be on the safe side in the present case if we pay attention to the Face 1 results separately, because all the dice used had exacavated spots. Dice manufactured in this way may be assumed ordinarily to favor other faces appearing uppermost rather than Face 1 because their center of gravity ought to be closer to the Face 1 side than to any of the other sides. Although there are other less obvious ways in

Table 3

RESULTS FOR FACE 1
(1956-57 Data)

Series	No. Trials	Dev.	CR	P
F1.....	1296,	+ 52	3.88	0.0001
F2.....	1296	+ 98	7.31	$<10^{-11}$
F3.....	1296	+ 41	3.06	0.0022
F4.....	1296	+ 54	4.03	0.00006
Total.....	5184	+245	9.15	$<10^{-18}$

which the dice can be biased, there is justification in this logic favoring a bias against the 1-face for presenting the figures for Face 1 separately for whatever suggestive value the variations in the rate of scoring within the 1-face data themselves may have. Table 3 gives these data for each of the four series from 1956-57.

It is interesting also to compare the deviations for the successive six sets in the session. The set results are contained in Table 4. There is no meaningful position effect among these six sets even though there is a tendency to score at or near chance expectation on Set. 5. The chi-square for the distribution of hits and misses among the six sets is only 5.03 (5 d.f.), with P = .4. Set 3 reached the highest level of scoring, with a CR of 2.68 (P. = .007).

Table 4

DEVIATIONS FROM CHANCE EXPECTATION FOR SETS 1 TO 6 IN THE SESSION (1956-57 Data)

Series	SET						Total
	1	2	3	4	5	6	
F1.....	+ 2	0	+18	+23	0	+ 6	+ 49
F2.....	+26	+29	+34	+ 6	+14	+14	+123
F3.....	+ 5	+ 5	+32	+18	−20	− 4	+ 36
F4.....	+ 7	+11	−12	+14	− 1	+37	+ 56
Total....	+40	+45	+72	+61	− 7	+53	+264
CR.....			2.68	2.28		1.98	
P.....			0.007	0.022		0.047	

Because it was not clear in the 1956-57 work whether the outstanding deviation on Face 1 was due to the position of Face 1 in the target sequence or to preference for that target itself, it seemed advisable to conduct some work using a different target order in the set. The four further series, F5 to F8, were accordingly carried out, in January and February, 1960. As already stated, exactly the same dice and the same throwing surfaces were used. The conditions were thus exactly the same, except that the target sequence in the set was faces 6, 5, 4, 3, 2, 1 instead of 1, 2, 3, 4, 5, 6.

Table 5 gives the results in the four new series, both separately and in total.

Table 5
GENERAL RESULTS
(1960 Data)

Series	No. Trials	Dev.	CR	P
F5.....	7776	+ 59	1.80	0.07
F6.....	7776	+135	4.12	0.000045
F7.....	7776	+ 82	2.50	0.012
F8.....	7776	+ 69	2.11	0.[illegible]
Total.....	31104	+345	5.26	<10

Again the results show that the deviation is outstandingly significa when three small dice were thrown on the hard surface (F6).

The distribution of the deviations in the 1960 work on the faces 6 to 1 is given in Table 6. The previously-observed outstanding deviation in the first unit in the set does not show up in the new experiment. On the contrary, the Face-1 target, the last unit in the set, shows the greatest deviation, which is significant with a CR of 4.02. The distribution of scoring over the six faces within the set in this case, however, is not significantly different from the expected rectangular distribution ($\chi^2 = 7.5$, 5 d.f.; $P = .2$), and therefore the effect on the 1-face in relation to the others, while suggestively high, is not significantly so. The preference is less marked than that found in the first half of the experiment.

Table 6
DEVIATIONS FROM CHANCE EXPECTATION FOR TARGET FACES
(1960 Data)

Series	Face						Total
	6	5	4	3	2	1	
F5.....	+31	+27	− 6	−10	+ 3	+ 14	+ 59
F6.....	+15	+16	+60	− 1	+10	+ 35	+135
F7.....	−15	−17	+32	+41	− 5	+ 46	+ 82
F8.....	+17	+21	+ 3	− 6	+21	+ 13	+ 69
Total....	+48	+47	+89	+24	+29	+108	+345
CR.....			3.32			4.02	
P.....			0.001			0.00007	

The deviations in the six sets in the session for the 1960 work are given in Table 7. It is interesting to observe that there are distinct position effects in the *set* sequence in the new experiment ($\chi^2 = 17.5$, 5 d.f.; $P = .003$). There is the U-curve tendency, well known to investigators in this field, with the most outstanding deviation appearing in Set 1 in the session. The deviation in Set 1 for all four 1960 series in combination is highly significant, with a CR of 5.0, corresponding to odds-to-one against chance of about one million. The experiment of 1960 thus reveals tendencies in the position effects which are different from those observed in the experiment of 1956-57. While the position effects in the first period are found in the *unit* sequence and not in the set sequence, in the second period such effects are found in the *set* sequence and not in the unit sequence. This result probably has to be ascribed to psychological conditions in connection with the change of the target sequence. It seems plausible to consider that the experimenter-subject may have focused his attention too strongly on the change in target order and that this was a disadvantage, causing the face-sequence effect to veer off into another channel, the *set* sequence. This is not a new observation since similar ones have been made by the writer in connection with his earlier work; for example, the "order effect" in previous placement experiments vanished when a conscious watch was kept for it, but it returned later on when it was no longer being looked for in the experiments.

Table 7

DEVIATIONS FROM CHANCE EXPECTATION FOR SETS 1 TO 6 IN THE SESSION (1960 Data)

Series	Set						Total
	1	2	3	4	5	6	
F5.....	+ 40	+17	− 4	− 5	+16	− 5	+ 59
F6.....	+ 60	+26	− 4	+ 1	0	+52	+135
F7.....	+ 12	+ 6	+15	− 4	+32	+21	+ 82
F8.....	+ 22	+14	+16	−10	+16	+11	+ 69
Total....	+134	+63	+23	−18	+64	+79	+345
CR.....	5.00	2.35			2.39	2.95	
P.....	$<10^{-6}$	0.02			0.017	0.003	

We shall now combine the results for the two sub-experiments carried out in 1956-57, Series F1 to F4, and in 1960, Series F5 to F8. Table 8 gives the total results for the four different physical conditions as regards size of dice and throwing surface. It is seen that the total deviation from chance expectation in the eight series F1 to F8 is +609, which is highly significant, with P being $< 10^{-9}$.

Table 8
GENERAL RESULTS
(Total Data)

Series	Size Dice	Surface	No. Trials	Deviation	CR	P
F1+F5.....	13 mm.	soft	15552	+108	2.32	0.02
F2+F6.....	5 mm.	hard	15552	+258	5.55	$<10^{-6}$
F3+F7.....	5 mm.	soft	15552	+118	2.54	0.011
F4+F8.....	13 mm.	hard	15552	+125	2.69	0.007
Total.....			62208	+609	6.56	$<10^{-9}$

The deviations for the faces 1 to 6 for both periods are given in Table 9. Face 1 gives by far the most significant results; Face 4 is the only other one that is clearly significant (CR = 3.03, P = .0024).

Table 9
DEVIATIONS FROM CHANCE EXPECTATION FOR TARGET FACES
(Total Data)

Series	Face						Total
	1	2	3	4	5	6	
F1+F5.....	+ 66	+19	−41	− 19	+29	+54	+108
F2+F6.....	+133	+ 6	+15	+ 93	− 6	+17	+258
F3+F7.....	+ 87	+13	+42	+ 50	−31	−43	+118
F4+F8.....	+ 67	+35	−20	− 9	+18	+34	+125
Total....	+353	+73	− 4	+115	+10	+62	+609
CR.....	9.30	1.92		3.03			
P.....	$<10^{-18}$	0.055		0.0024			

Taking account of the chronological order of the units (faces) in the set in both periods, the results shown in Table 10 are arrived at. The highest rates of scoring are in the first and last units, but this

is due to the high rate of scoring on Face 1 in the two experimental periods. There is an over-all tendency for the scoring rate to decline through the fifth unit.

Table 10

DEVIATIONS FROM CHANCE EXPECTATION FOR UNITS 1 TO 6 WITHIN SET
(Total Data)

Series	Unit						Total
	1	2	3	4	5	6	
F1+F5.....	+ 83	+43	−37	−23	+ 5	+ 37	+108
F2+F6.....	+113	+12	+76	+32	−12	+ 37	+258
F3+F7.....	+ 26	+ 1	+33	+59	−19	+ 18	+118
F4+F8.....	+ 71	+35	−11	−18	+18	+ 30	+125
Total....	+293	+91	+61	+50	− 8	+122	+609
CR.....	7.72	2.39				3.21	
P.....	$<10^{-12}$	0.016				0.0013	

Finally the distribution of the deviations on the different sets in the session in the total experiment is given in Table 11. This table is interesting because *all* the 24 set deviations are positive; that is to say, they are all in the expected direction. In addition there is a distinct U-curve in the distribution of the six set deviations in the total experiment, with the greatest deviation in the first set. The probability of getting all 24 set deviations in the expected direction is

Table 11

DEVIATIONS FROM CHANCE EXPECTATION FOR SETS 1 TO 6 IN THE SESSION
(Total Data)

Series	Set						Total
	1	2	3	4	5	6	
F1+F5.....	+ 42	+ 17	+14	+18	+16	+ 1	+108
F2+F6.....	+ 86	+ 55	+30	+ 7	+14	+ 66	+258
F3+F7.....	+ 17	+ 11	+47	+14	+12	+ 17	+118
F4+F8.....	+ 29	+ 25	+ 4	+ 4	+15	+ 48	+125
Total....	+174	+108	+95	+43	+57	+132	+609
CR.....	4.58	2.84	2.50			3.47	
P.....	0.000005	0.0045	0.012			0.0005	

0.5^{24} = about 6×10^{-8}, which is of the same order of magnitude as that found previously for the significance of the total deviation in this experiment ($P < 10^{-9}$). The distribution of the set deviations thus strengthens the opinion that chance is not the explanation for the results, although the two observations are not independent.

Discussion

It is interesting to observe that positive deviations of strong significance have been obtained in this experiment with die faces as targets, just as they were produced previously in the author's placement experiments, where the target was an area of a dice table within which the subject desired moving cubes to come to rest. In both cases, recognized laws of dynamics cannot account for the results. A factor of a psychological kind must have been involved in the process because the movements of the cubes, when considered in terms of the over-all results, were in accordance with the intentions of the experimenter.

The most striking psychological feature of the results during the 1956-57 period was the high rate of success of the first unit of the set. This appears to be related to the high scoring on the first throw of the set in the author's PK placement work. But if this effect started as a position factor, it may have continued, in part at least, as an acquired psychological preference for the 1-face. At least, the first unit was no longer favored in the 1960 work, while there remained a marked advantage on the 1-face. Too much importance should not be attached to this observation because of the impossibility of ruling out with finality the alternative interpretation that the dice were biased to favor the 1-face. But it should be kept in mind that this question does not bear upon the interpretation of the data as a whole as evidence for PK since the method of throwing equally often for each face of the die insured that any physical imperfections causing a favoring of one or more faces would be cancelled out in the total results.

An interesting observation in these experiments with die faces as targets is that considerably higher scores have been obtained with small cubes thrown onto a hard surface than with the same cubes thrown onto a soft surface. The deviations obtained with the large

dice are approximately the same for both kinds of surface. The difference between the deviations obtained with the small cubes on the hard surface and on the soft surface has a CR of 2.13, with P = 0.032. This is not a significant figure, but nevertheless a suggestive one, and it bears on the hypothesis that the nature of the throwing surface is a point to consider.

It should be emphasized that this experiment was not conducted with the objective of looking for crucial evidence for a PK effect. Rather, the aim was an exploratory one in which the writer wished to find out how he would succeed with trials for die face after having tested himself for several years in PK placement. The results are offered here for whatever interest they may have for other workers and students in the field. The only counterhypothesis which is not controlled by the conditions or results of the experiment is recording errors. Nothing can be said except to state that care was taken to render this interpretation as unlikely as possible.

Skilled throwing is rendered highly unlikely as an interpretation because of the fact that the best results were found with the condition which caused the most bouncing of the dice. It has been observed that bouncing of the dice occurred to a much greater extent when the small dice were thrown onto the hard surface than in any one of the other three conditions. On the soft surface both the small and the large dice came to rest after a small number of rolls. There was no distinct bouncing observed with either kind of cube on the soft surface. The large dice, when thrown onto the hard surface, were subject to some bouncing, but they made considerably fewer rolling turns than the small ones on this same surface. The fact that the small dice on the hard surface produced the best results is opposed to the use of any unconscious skill in throwing the dice.

Dice bias is excluded in the total results by the equal use of all faces as targets. According to these observations there is some justification for speculating that the outstanding results with the small dice on the hard surface were due to the larger number of rolls produced in this case. This would lead to the assumption of a PK effect working during the whole process of movement, gradually controlling the die so as to ultimately bring it into the target position.

The kind of physical agency which produces the aberration in the movements of the cubes has always been a problem in PK research. Since the cubes are macrophysical bodies, we have to admit forces of a recognized physical kind for explaining the aberrations. The *control* of the forces leading to the different statistical effects in the observed results represents another problem which, however, must be distinguished from the *physical* problem of how the aberrations are produced. The interconnection of the controlling action and the aberrative forces represents a further problem.

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PHYSICALITY AND PSI
A SYMPOSIUM AND FORUM DISCUSSION

Editorial Introduction

The theoretical implications of psi phenomena have caught the imagination of a number of philosophers and of some experimenters in their more reflective moments. The discussion generally centers on the extent to which the findings affect the picture of the universe which the science of physics presents. The issue is one of central importance for the field. For instance, it bears upon the relation of parapsychology to the other sciences. The editors are therefore undertaking to bring some of the views on this general topic to the attention of readers of the *Journal*. The discussion is being launched in the present number in the form of a series of four short papers.

Further contributions to the discussion are solicited for consideration in later numbers of the *Journal*. Articles submitted as general discussions on the topic should be between 800-1600 words in length, and specific comments upon statements contained in previously published papers in the series would normally be briefer than this suggested length.

In order that the discussion may have common points of reference, contributions should be worded to bear on some or all of the questions listed in the following paragraphs:

A number of workers in parapsychology over the past 75 years have pointed out that its phenomena are characterized by not conforming to physical law. Psi effects appear not to represent physical principles, and this, more than any other distinctive feature, has defined the field.

Do you agree with this view? If you do, to what extent do you think we can generalize about it? Whether or not you do, how would you propose to define psi phenomena, as distinguished from those studied by the other branches of science, including general psychology?

If you consider psi phenomena nonphysical what importance do you see in them for the question of philosophical dualism?

In your judgment how would the acceptance (or rejection) of the physical nature of psi affect one's view of man's nature, his volitional freedom and morality, and his traditional beliefs about his post-mortem survival?

DISCUSSION BY MICHAEL SCRIVEN
Department of the History and Logic of Science
University of Indiana

What does "physical" mean? There are many entities in modern physics which lack the characteristics of everyday physical objects such as chairs and tables. An electromagnetic field is physical in that it is an entity of physics but it is not physical in the sense of being visible or tangible to normal senses. Obviously psi is nonphysical in the latter sense, but this would not make an interesting claim. At the moment, it is nonphysical in the first sense. But even that is not a very interesting claim, since the same was true of electromagnetic fields not so long ago. Physics is always expanding its frontiers. Now the interesting claim would be that there is some *impossibility* about the idea of a physics encompassing psi. But I see no possible way of justifying that claim any more than the claim that science could never explain the origin of life on earth.

It seems to me that a good parapsychological experiment is *by definition* one which shows there is something new under the sun, i.e., creates the necessity for *expanding* physics (and probably psychology). But it is just as misleading to assert it demonstrates the existence of something nonphysical, as it would have been for Helmholtz or Michelson or Einstein to say this of their discoveries which demonstrated the inadequacies of the physics of their day.

More remains to be done before we can assert definitely that the varied resources of contemporary physics cannot cope with psi. Even the simpler inverse-square-law forces have not been absolutely ruled out, and modern field theories have included discussions of causally reversed processes, perhaps the most awkward psi phenomenon. It need not weaken our enthusiasm for parapsychology to realize that the opposition to it is largely based on an absurdly parochial idea of the limitations of physics. We should be progressive physicalists, not reactionary anti-physicalists!

The idea of physical causation operating across a vacuum was just as repugnant to the conservatives of earlier physics as ESP is to some of our contemporaries, but the experimenters who showed that a magnet could affect iron filings in a vacuum did not claim to

have discovered a nonphysical phenomenon. Yet probably a majority of parapsychologists today would make that claim about ESP. Why? I believe the real explanation is the fact that a *person* is involved in ESP, and that we are always more willing to accept the idea that *we* transcend the limitations of things. Remarkable though we are, however, we are remarkable *objects*—physical objects with some capacity for locomotion, communication, and reproduction. But it might be said that we are absolutely unique in our possession of a mind, and psi is a specifically mental, and in that sense nonphysical, phenomenon.

The mind-body problem cannot be resolved in this space, but a possible treatment of it can be stated and may be of some interest. 1. We are not unique in possessing a mind. Animals have them, and I see no impossibility in the supposition that we shall create robots or living things who also have them. 2. Mental events are not analyzable behavioristically, nor are they (though they appear to be correlated with) brain events. 3. They are sometimes caused by brain events. 4. They can sometimes correctly be said to cause other mental events and also actions, but not brain events. 5. To say that a twinge of pain (mental event) led one to go to a doctor (action) is not to deny that another entirely adequate causal explanation referring only to the brain can be told (whereas it can not be said that an adequate mental causation explanation can be given of cases where direct electrical stimulation of the brain produces mental events). 6. Any system capable of behaving like humans with respect to (i) stimulus discrimination (ii) symbolic manipulation, has a mind.

This account is (a) dualistic, (b) materialistic, in a certain sense, (c) epiphenomenalistic, (d) interactionistic, in a certain sense, (e) novel, as far as I know. It has the following consequences:

A. ESP and PK have no relevance to it; they simply become extra powers of the mind-brain unit. But if the correlation between mental events and physical events broke down or failed to appear with respect to certain mental events, psi might become an important datum for the new mind-body problem. I am thus suggesting that the oft-quoted "absence of an ESP organ in the brain" will be eliminated either by discovery or creation, i.e., by the correct insistence

that if the owner of the brain has psi faculties, and can't do without a brain, then the brain *is* the ESP organ—though I naturally expect some slightly better localization than that. Since new fields and forces may be involved, it is not significant that no organ of the usual kind has been discovered.

B. Free will is a matter of causation of a certain kind, not an absence of causation. Morality is a system of rules for behavior and attitudes with a complex but potentially rational basis. Psi is again irrelevant.

C. Post-mortem survival is made extremely implausible but not logically impossible; and here telepathy might provide the departed spirits with a providentially disembodied means of communication. Survival would simply prove the basic correlations nonuniversal; and the mind-body problem would take a new form and new solutions. (But other psi phenomena do not make survival likely.)

In summary, psi phenomena are psychological phenomena and hence—in certain aspects—physical phenomena, that appear to be of a categorically different kind from the usual phenomena of perception and causation. The difference lies in the impossibility of giving a causal account of the kind enshrined in classical nineteenth-century physics (as clearly demonstrated by Professor Broad), and has no relevance whatsoever to the mind-body relationship as I conceive it, nor to the freedom of the will and morality.

Discussion by C. D. Broad
Knightsbridge Professor of Moral Philosophy
Trinity College, Cambridge University

For any complete discussion of this topic, it would be necessary to begin by trying to determine the meaning and the range of application of the two terms. As to *psi,* I have already attempted in some of my published writings to delimit the application of the term *paranormal phenomena,* which I take to be synonymous with *psi.* But I have never seriously reflected on the term *physicality* and I doubt whether (in view of the recent very radical revolutions in the concepts of theoretical physics) it has at present any generally accepted meaning or range of application.

In order for a phenomenon to count as an instance of psi it is necessary and sufficient that it should conflict with one or more of

several "basic limiting principles," which I have tried to enumerate and formulate in the essay entitled "The Relevance of Psychical Research to Philosophy" in my book *Religion, Philosophy, and Psychical Research* (Harcourt Brace & Co., 1953). These are certain very general principles, of a negative or restrictive kind, which are commonly taken for granted nowadays by educated persons, and which form the framework within which all our practical life, our scientific theories, and even the plots of most works of fiction, are confined. For the present purpose it will suffice to take as examples certain typical psi phenomena for which there is reasonably good evidence. In regard to each of these we can consider which of the basic limiting principles it would contravene. The reader may then be left to decide for himself whether conformity to the principle in question is or is not an essential feature in what he understands by "physicality."

I. *Card-guessing Experiments.* Let us begin with such experiments in this topic as have been done by Dr. Soal in England and by Professor Rhine and his collaborators in the U.S.A. These are sometimes described as providing evidence for paranormal *cognition.* That is misleading, unless *cognition* be understood in a purely behavioristic sense. The response of the experimental subjects is, *not* to have any specific conscious experience at all, but to perform without premeditation some specific bodily movement, e.g., to write down automatically the initial letter of the name of one or other of a certain five symbols which he knows to be the only ones depicted on the target cards. What constitutes success in such an experiment is that the proportion of occasions on which the symbol written down by the subject agrees with the symbol on the target-card for that occasion should deviate, to a statistically significant degree, from the proportion most probable on the hypothesis of chance-coincidence.

Now in successful experiments of this kind we may suppose *a priori* that any one or any combination of the following kinds of factor is influencing the nature of the subject's response: (1) the *purely objective* state of affairs as to the nature of the target itself; (2) *knowledge or belief* as to the nature of the target, acquired normally by some person or persons *other than the subject,* either (i) *before,* or (ii) *simultaneously with,* or (iii) *after* the subject's

response; or (3) *knowledge or belief* as to the nature of the target, acquired normally by the *subject himself after* he has made his response.

It is not at all easy to design experiments in which all but one of these possible influences shall certainly be absent, and this is harder in the case of some of them than in that of others. That, however, is not important for our present purpose. For it is easy to show that any of these alternatives would conflict with at least one universally accepted basic limiting principle. This I will now do.

(1) To suppose that the *purely objective facts* as to the nature of the target should influence the nature of the subject's response would conflict with the principle that a person's reactions to any physical object or event outside his body must be mediated by some physical process emanating from that external object or event, traversing the space between it and his body, and thereupon stimulating some appropriate receptor organ in his body. (2) To suppose that the nature of the subject's response were influenced by knowledge or belief acquired normally, whether by another person or by himself, *after* that response had been made, would conflict with the principle that a state of affairs cannot begin to influence anything until it has come into being, and therefore cannot influence any event or process which was completed before it had begun. (3) To suppose that the nature of the subject's response were influenced by knowledge or belief acquired normally by *another person, before or simultaneously with* that response, would not of course conflict with the last mentioned principle. But it does conflict with another. This is the principle that a state of knowledge or belief in B cannot influence the experiences or the actions of A, unless it be expressed in speech, writing, gestures, or other overt bodily signs by B, and unless these, or replicas of them, be perceived by A and interpreted (wittingly or unwittingly) by him.

II. *Phantasms of the Living.* I pass now to sporadic cases of the following kind. Here A has a hallucinatory *quasi*-perceptual experience at a moment shortly before or simultaneous with or shortly after the time at which B is undergoing a certain crisis. The nature of B's crisis is so peculiar, and the details of the content of A's hallucination are so closely correlated with its details, that it is

unreasonable to believe that the concurrence of the two is a mere chance-coincidence. Yet at the time when A had his hallucination there was no normal means by which he could have learned that B was then undergoing, or had lately undergone, that crisis. Nor was there anything in A's past experience and present situation which could lead him to anticipate, either by explicit inference or by non-inferential expectation based on associations already formed in him, that B would soon be undergoing such a crisis.

Such cases differ from the experimental ones considered above in that here it is proper to talk of paranormal *cognition*. A is not merely *doing* something automatically with his fingers, which turns out to be positively or negatively appropriate to the nature of the target on an unexpectedly large proportion of occasions. He is having a *conscious experience* of a highly specific kind. And this corresponds to B's crisis, either in the literal kind of way in which a normal veridical sense-perception corresponds in content with the thing or event which is its object, or else by some very obvious symbolism, as e.g., a vision of a funeral procession would symbolize a death. (The nearest experimental analogue to such cases is where the experimental agent looks at, or calls up an image of, a certain object, and the remote experimental subject at much the same time has an image or a *quasi*-sensory hallucination of a similar object.)

Now there is a certain general principle, which is commonly accepted nowadays without question by physiologists and psychologists in regard to normal and even to *ab*normal (as distinct from *para*normal) perceptual and *quasi*-perceptual experiences. It may be formulated roughly as follows. An essential factor in the *immediate* cause of any such experience is a certain simultaneous event in the *brain* of the person who has that experience; and the sensory or *quasi*-sensory content of the experience is correlated with certain physiological features of that brain-state. Now, in view of this principle, two alternatives present themselves as to the causation of veridical hallucinations such as we are considering.

(1) We may assume that the above general principle applies to them also. If we do this, the problem that faces us is this: How is the state of A's brain, on which his veridical hallucination immediately depends, and with which its *quasi*-sensory content is correlated, produced? In particular, how are we to account for the fact that that

state of A's brain is of such a nature that the experience to which it gives rise in A corresponds, to a degree altogether beyond chance-coincidence, with the crisis which the distant B is undergoing at much the same time?

(2) The second alternative is to refuse to apply to such *para*-normal *quasi*-perceptual experiences this general principle which is commonly taken for granted in regard to those which are normal or merely *ab*normal. On that view, we are to suppose that there is ***no*** specific correlate in A's brain to that *quasi*-perceptual experience of his which corresponds in content with B's roughly simultaneous crisis. We should then presumably have to postulate some kind of ***immediate*** causal connection between B's crisis and A's corresponding experience, instead of a connection mediated through a state of A's brain which would be the immediate cause of his experience on the first alternative.

Now there is, so far as I am aware, no *direct* evidence either for or against the first alternative. But it is ***prima facie*** preferable to the second. For it involves less of a breach with what we all take for granted in the case of other experiences which are ***phenomenologically*** quite similar to veridical *quasi*-sensory hallucinations, e.g., ordinary dreams, hallucinations produced by drugs or by hypnosis, and so on. And, moreover, the second alternative would seem to have no advantage over it in the way of suggesting fruitful working hypotheses or making the paranormal facts easier to swallow.

On either view we are faced sooner or later with a breach of a basic limiting principle. With the ***second*** alternative this comes at the first move. For the notion of an experience in B contributing *directly* to evoke an experience in *A* conflicts with the accepted principle that communication of an experience in B to A can take place only in the following roundabout way, viz., through B's experience being associated with a characteristic change in his body, through that change initiating a transmissive physical process in the medium between B's body and A's, through this evoking a change in A's body, and through this (or rather a causal descendant of it in A's brain) evoking a correlated experience in A.

With the ***first*** alternative the conflict comes at the second move. It arises over the causation of the relevant state of A's brain. There would seem to be two alternative possibilities here. (i) It might be

suggested that the remote initiating cause is that *state of B's brain* which is the immediate bodily correlate of his crisis. Or (ii) it might be suggested that the initiating cause is B's *experience itself* (as distinct from the state of his brain which is its immediate bodily correlate) acting *directly* on A's body and producing "psychokinetically" the appropriate change in his brain.

Either of these suggestions would conflict with a generally accepted limiting principle. The first would be difficult to reconcile with the accepted principle of the denial of instantaneous *actio in distans.* That principle claims that events separated in space can influence each other only if they differ in date, and if the temporal gap between them be filled by the successive phases of a continuous process which traverses the spatial gap between them. Such facts as are known about the spatio-temporal relations between a crisis in B and a veridical hallucination concerning it in A seem hard to reconcile with that principle, even when B's crisis *precedes* A's hallucination. Where A's veridical hallucination is strictly *simultaneous* with B's crisis, or precedes it (as in cases of precognition), the facts cannot possibly be reconciled with the principle.

The second suggestion brings us to the question of "psychokinesis," to which I now pass.

III. *Psychokinesis.* It is claimed by some experimenters that a volition in the subject that dice should fall in a certain way tends to be associated, to a statistically significant extent, with their falling in that way, in circumstances where the subject cannot have influenced the result of the throw by any deliberate or unwitting process of manipulation. This would conflict with the generally accepted principle that nothing in the material world can be *directly* influenced by any mental state (e.g., a volition or an emotion) except certain processes in the body of the person in whose mental history that volition or emotion is an item.

If the alleged paranormal facts be accepted, there would seem to be two alternative possible views to take about them. One would be simply to drop this particular basic limiting principle. There is, after all, nothing self-evident about it, unless indeed it be made part of the definition of what is to be understood by the phrase "a person's body." The other alternative would be to keep the principle, but to

suppose that a person's "body" includes something beside what we commonly take it to do; and that some component of it, or some kind of physical "field" associated with it, extends, either habitually or on special occasions, in a form not normally perceptible by the senses or registrable by scientific instruments, beyond its normally perceptible limits. (Those who talk of "the human aura," "the astral body," and so on, presumably hold some variant of this view.)

IV. *Phenomena Suggestive of Survival of Bodily Death.* It will be plain that I do not think that any of the kinds of psi phenomena so far considered, however well they may be or may become established, *necessitate* what I may call a "substantival-dualistic" view of the constitution of the human individual. Nor can I see that the adoption of such a view is of any obvious advantage in suggesting working hypotheses for further empirical investigation of the subject. But there are phenomena which seem *prima facie* to suggest at least the persistence of a person's memory-traces and dispositional organization after the death of his tangible and visible body. And there are some which suggest, not only this, but also intelligently planned post-mortem activity. The vast majority of mediumistic communications, even of excellent quality, do not require us to make this assumption. But *some* mediumistic communications, e.g., some of the "cross-correspondences" and some sporadic experiences of normal individuals ("Phantasms of the Dead"), are very difficult to interpret at all plausibly on any other hypothesis.

In my opinion it is these and only these paranormal phenomena which obviously conflict with the commonly accepted principle of "substantival monism" as regards the constitution of the human individual. By that I mean the principle that a person's mental life is wholly bound up with and dependent upon the integrity, the physiological organization, and the continuous functioning of his brain and nervous system. These phenomena do suggest rather strongly that a human individual is in some sense a *compound* of his visible and tangible body and of *something else,* which is capable of persisting after the destruction of the former. They suggest that this persistent something can carry memory-traces and dispositional organization, and can form the basis of intelligently planned *post-mortem* action, in line with the *ante-mortem* experiences, interests, and intellectual

capacities of a certain deceased individual. I would add, in conclusion, that I see no reason why this persistent something should not be extended and in a sense located, and why it should not have certain physical properties.

DISCUSSION BY J. G. PRATT
Parapsychology Laboratory, Duke University

As one of the editors of this *Journal,* I read the contributions of Dr. Scriven and Prof. Broad before writing out my thoughts on the relation between parapsychology and physics. I shall not, therefore, hesitate to refer to what they have said, even though this would normally not be done before the "rebuttal" stage of a discusssion.

Why do I not take the more modest course of waiting until later to comment? The reason is that the range of differences in viewpoint needs to be represented at the time of launching a discussion. Prof. Broad and Dr. Scriven appear to be in essential agreement. They both seem to me to say that it is not possible to state specifically at this time what physicality means, and that it is therefore not possible to make any sharp distinction between physicality and psi. Other students of parapsychology have offered opinions which are opposed to this one. My own views may appear to conflict with most of those stated in the two preceding contributions, and I fear for my safety in thus challenging two such highly regarded philosophers on what is basically a philosophical issue. I dare to do so only because of a conviction that the issue is one of central importance for the young science of parapsychology. Is it unrealistic to hope that discussion will show that the differences in opinion are really not so great after all?

Psi phenomena include those, and only those, effects that appear not to represent physical principles, and I would agree that this, more than any other distinctive feature, defines the field.

This statement does not, as far as I can see, conflict with Prof. Broad's definition that "for a phenomenon to count as an instance of psi it is necessary and sufficient that it should conflict with one or more of several 'basic limiting principles.'" His limiting principles are themselves formulations of physical laws generally assumed to apply to the behavior of living organisms.

Still another way of defining parapsychology, which some workers seem to prefer, is simply to list the phenomena with which the research is concerned. This kind of definition is unsatisfactory, since it merely leaves unstated the principle that leads to the grouping of certain phenomena and the exclusion of others.

Of course we do not know all about the physical world at present. In this sense we cannot give a complete and final meaning to the word *physicality.* But to recognize that physics has its own frontier of knowledge is not to say that psi must be assumed to be a part of the unexplored physical world.

Since this discussion turns largely upon the meaning of words, it is essential to be explicit regarding the definitions of some key concepts. *Physics* is the branch of science which deals with conditions and changes within the material universe that are capable of being described in terms of time-space-mass-energy relationships. *Physics is not synonymous with science.* If one starts with the assumption that it is, as it seems to me Dr. Scriven does, of course there is no possibility of making any basic distinction between physicality and psi. But such an assumption begs the question. If there ultimately should prove to be some range of natural (parapsychical) phenomena that are irreducibly beyond the scope of physics, this state of affairs would not of itself be a contradiction of the concepts of that area of knowledge. It is simply a question of whether parapsychology represents an extension of physics or an extension of science beyond the borders of physics, as that branch can properly be defined.

Parapsychology, as a branch of science, needs to be defined in relation to other branches of science. The only way such a definition can be stated with any precision is in terms of present-day scientific concepts. Psi and physics are irreconcilable in terms of what we know today, and present knowledge is the only knowledge we have at our disposal in trying to relate them.

To say that psi phenomena are those personal events that are unexplainable by physical principles is not to say that no way will ever be found to reconcile the two. Indeed, inasmuch as the facts of physics and parapsychology are both parts of the same universe, it is certain that they *are related* even though we do not understand how. Future advances of scientific knowledge will, we trust, reveal the nature of this "unity." But from our present position, it is just

as reasonable to suppose that the reconciliation will be achieved by extending the concept of the nonphysical as by a broadening of the concept of the physical.

No one, I think, would claim that psi is the science of nonphysical aspects of nature in any sense except that of our present knowledge. We can safely leave to the future the revision of existing concepts or the formulation of new ones to keep us in step with new scientific facts. But we need to know what parapsychology is *at this time* in relation to present-day scientific thought.

Psychology, the science of the behavior of living organisms, obviously includes parapsychology, and the latter is only one of many aspects of the former, the parent field, which border upon and overlap with physics. The precise degree of overlapping with physics for each special function investigated by psychologists is not known at present. Many psychological phenomena can be described rationally in terms of physical concepts, even if only on a theoretical basis. Psi phenomena are precisely those psychological events which defy description in terms of any physical theory now available. The difficulties of explaining the findings of parapsychology in physical terms have only become greater as the research has advanced. The failure of the physicists to claim psi phenomena during eighty years of scientific study of these effects surely justifies a serious doubt whether the psi processes *are* physical. If this inference be wrong, let the physicists welcome psi as a part of their own area and show how it fits into their existing body of knowledge!

The mind-body problem has remained an open question in spite of centuries of philosophical debate about the great issue involved. The question of the bearing of mental and physical processes upon the nature of the universe could not be settled because of the ambiguity of the data of observation and experience which gave rise to the mind-body problem. Different views of the nature of reality, especially of man as a part of existence, have therefore advanced or receded in accordance with the cultural and scientific climate forming the background of philosophical thought. The philosophy of materialism has in our period gained the ascendency in Western scientific thinking. This position of influence is not based upon direct evidence in favor of physical monism; it is, rather, a result of the advance of physics, the science of the material world, the success

achieved in extending physical principles into the areas of biology, medicine, and even psychology, and the understandable preference for an explanation of all observable phenomena that is as simple as possible.

Psi phenomena are the first experimentally demonstrated effects in man that cannot be theoretically reconciled with the current purely material (physical) operations. These effects thus provide direct evidence for operations in living organisms which involve something more than can be ascribed to the functions of the physical organism. Physics, for example, offers no help toward understanding how a person can have a noninferential accurate experience of a complicated event before it occurs. If we hold to our concept of a *physical* organism (as I most certainly do), psi thus makes it necessary to recognize the occurrence of something in addition to the physical (as we know it or can conceive it)—a kind of basic duality.

Freedom of the will does not imply an absence of causation; I agree with Dr. Scriven that it is a question of the kind of causation. By freedom of the will, I take it we mean an ability of the individual to make choices that are in some degree independent of the physical order. If all action, including behavior, were reducible to purely physical effects, free will in this sense could not exist. But if there is an order of mental causation which is to some degree independent of the physical order, then the concept of choice becomes meaningful at least as a logical possibility. Psi effects are events which establish the existence of this second order of causation. (Again, we need to remember that we are at the beginning of our scientific knowledge, not at the end.)

Ethics, as Dr. Scriven indicates, is a system of rules for behavior, but in what sense may an individual's conduct conform to the rules? If his morality only represented behavior over which he had no control, there would be no basis for assigning personal responsibility for keeping or breaking the rules. As far as society is concerned, the rules might serve a purpose as a sort of program for the regulation of human automata. But is there any aspect of human nature which indicates that an individual may be truly capable of making ethical decisions? Here psi *is* relevant.

Psi as a nonphysical aspect of man's nature points to the possibility of some sort of survival of personality after death. Such sur-

vival would be impossible for a purely materialistic "personality" that could be proposed in terms of the physics which we know today or of any advances in physical knowledge of which we can conceive. Within the limits of present knowledge, therefore, any surviving aspect of personality would not be physical.

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Psi is by general agreement not explainable in terms of present-day physics. This fact alone is sufficient to indicate the *possibility* that it *may be* nonphysical. Certainly, in terms of present knowledge, it is demonstrably beyond the scope of natural operations that can be expected to occur on a purely physical basis.

If there *is* a true and fundamental distinction between psi and those operations in the world of matter which form the domain of physics, this is easily the most important scientific generalization about psi phenomena which we can make. The degree to which psi has challenged explanation in terms of known physical laws suggests that the distinction may be a basic one. To hesitate to recognize it at this time because we do not yet know all there is to know about the material world is to risk obscuring what may be the essential characteristic of these mysterious findings. Today, physics and parapsychology are the two branches of science that stand most strikingly opposed to each other. When, where, and under what terms may they become reconciled? Our job as parapsychologists is to help to answer this question.

Discussion by Cyril Burt

Editor, *British Journal of Statistical Psychology*

The classical physics of the nineteenth century was based on a conception of the universe which was at once monistic and mechanistic. In its simplest form it postulated a single three-dimensional container called space, persisting in unidimensional time, a single type of substance, namely, particles of matter, characterized by a single property, namely, inertial mass, and capable of undergoing only a single type of change—change of position or motion—all susceptible of measurement and consequently of mathematical treatment. The apparent differences between one physical body and another were attributed solely to differences in the number, arrange-

ment, and movements of their constituent particles; and the changes which they exhibited were assumed to be deducible from those of the elementary particles in accordance with a single additive law of composition—the parallelogram law as applied to vector quantities. All such changes were subject to three universal laws: the law of strict deterministic causation, the law of the conservation of matter, and the law of the conservation of energy. Where the motion of the particles was not amenable to direct observation, the basic laws could be expressed in the form of Lagrange's equations, where the variables are on the one side "generalized coordinates" and on the other, "generalized forces." (Cf., e.g., R. B. Lindsay, *Concepts and Methods of Theoretical Physics,* 1951.)

Into this highly simplified system, astronomy, kinetics, and kinematics fitted very neatly. Moreover, the essential phenomena of color, sound, warmth, touch, and the like, as studied by optics, acoustics, heat, and mechanics, could be interpreted in terms of much the same scheme. The progressive investigation of electricity and magnetism required certain minor modifications: mass, it was suggested, might be regarded as an electromagnetic phenomenon, and in that case electric charge would furnish a more appropriate choice for the basic property. And thus, within a short space of time, so at least it was widely believed, chemistry would be reduced to physics, and biology and physiology to chemistry. As for consciousness: that, it was maintained, was a mere epiphenomenon, generated by the physical processes in the brain, but of no influence or interest in or for itself. And in general, if anything appeared incapable of physical explanation, that would soon prove to be a sheer illusion due to the unanalyzed complexity of the phenomena concerned. Thus—in theory, though not as yet in fact—the whole world could be interpreted in terms of a single self-contained deductive system.

Now such processes as telepathy, clairvoyance, precognition, psychokinesis, and the like, whether or not they actually occur, could not possibly be forced into agreement with the restricted tenets of this Procrustean system. On the contrary, they seemed to form a pretty distinctive group, all characterized by the fact that the phenomena envisaged not only fail to conform to, but actually conflict with, the fundamental laws of physics. Today, however, such a distinction and such a definition seem no longer adequate. The theory of relativity,

the proofs of Heisenberg's uncertainty principle, and many other paradoxical results studied in quantum theory have completely shattered the old-fashioned picture; and, since the neural processes at the synapses within the cortex of the brain are of such an order that the principles of quantum physics rather than those of molar physics must apply to them, it would seem that there is nothing whatever in *contemporary* physics which would preclude the apparent anomalies presented by psi phenomena.

What is more, there now can be little doubt that the attempts of the earlier American behaviorists and the later Austrian positivists to banish consciousness as a mere ghost in the machine have collapsed. Consciousness in the sense of immediate awareness can be neither explained nor explained away: it is a unique, irreducible relation, characteristic of certain processes (namely, psychological processes) and not of others (namely, processes that are merely physical).

Now, as the various designations themselves imply, the phenomena of parapsychology, extrasensory perception, or psi—in a word, all the various manifestations which have formed the subject of "psychical research"—are essentially psychological phenomena. Hence it is not sufficient to define them as those phenomena which "are characterized by not conforming to physical laws," or which "appear not to represent physical principles." Many of the unexpected phenomena encountered in the study of quantum physics would seem to be "characterized by not conforming to physical laws" as ordinarily understood, since their occurrence is quite unpredictable. The same may be said of biological phenomena. The processes that are really typical of living organisms conform, not to physical laws, but to more complex principles of their own; and whether these more complex principles can be ultimately reduced to laws of physics remains an open question. And certainly organic processes which are accompanied by consciousness cannot possibly be said to "represent physical principles." Why light with a wave-length of 0.000067 cm. should produce a sensation of red and why substances with the formula $C_{12}H_{22}O_{11}$ should taste sweet are questions that plainly defy a purely physical solution.

How, then, are the particular psychological phenomena that are commonly grouped under the term *parapschology* to be distinguished

from those which form the subject-matter of general psychology? The phenomena of general psychology—at least those which are best understood—seem to be partly dependent on, if not actually determined by, certain physiological conditions. On the receptive or cognitive side, normal perception appears to be mediated by processes occurring in the sense-organs, the afferent nerves, and the sensory areas of the cerebral cortex; on the executive or conative side, conscious or voluntary action appears to be mediated by processes occurring in the motor areas of the cortex, the efferent nerves, and the muscles; many of the intervening activities, including those of memory, imagination, and thought, appear to be mediated by processes occurring in the so-called association areas. Even where we have no detailed or certain knowledge of the underlying physiological processes, it is generally assumed as a plausible working hypothesis that the conscious processes are largely, though perhaps not completely, dependent on and determined by physiological processes within the central nervous system and other parts of the living organism.

Now, as ordinarily conceived, the alleged phenomena which fall within the province of psychical research—telepathy, clairvoyance, precognition, psychokinesis, and the appearances and communications attributed to the surviving spirits of persons who have died—are in no way mediated or conditioned by the sensory or neurological mechanisms of the individual. And this would form the basis of my own definition of "psi"; namely, those psychological phenomena which in principle seem wholly independent of the physiological processes that apparently determine other types of psychological phenomena. It is clear, however, that this cannot provide a fixed or final classification. Like mesmerism, many of the phenomena which at present seem paranormal may after further research prove to be dependent on or even occasioned by physiological processes; and like mesmerism, I imagine, whatever phenomena of this type are eventually established will in the long run be regarded as falling within the scope of general psychology. But equally I believe that many, if not all, the processes of consciousness which are at present regarded as normal, will, in many of their aspects, turn out to be quite as independent of the physiological processes of the brain as those which at present are classed as paranormal. Ordinary consciousness is a

far greater miracle than either telepathy, clairvoyance, precognition, or psychokinesis; and, as I have argued elsewhere, by placing the emphasis on the paranormal character of the phenomena instead of on their psychological character, students of psychical research have to some extent impeded the scientific study of the problems concerned and delayed the acceptance of results already achieved.

Our views on the relevance of psi phenomena to philosophy must depend on our beliefs about the problems with which philosophy as such is specifically concerned. With comparatively few exceptions, I take it, most present day philosophers would agree that two of its most important tasks are to criticize and coordinate (*a*) the methods of the several sciences, and (*b*) the more general conclusions of the several sciences as currently practiced and accepted. I myself should regard these two functions as special cases of the two wider topics with which philosophy has traditionally been concerned, namely, epistemology and ontology. Under the former heading, one of the long-standing controversies has been that of epistemological dualism; and here, I believe, psychical research, so far as it deals with questions of cognition, is undoubtedly relevant. Under the second heading the most important issue is that of psychophysical dualism. And this is perhaps the most obvious of the philosophical problems on which the results of psychical research have a direct and definite bearing. In both cases, so far as can be foreseen, positive results are likely to favor dualistic rather than monistic views. No doubt the universe has unity as well as variety. But if there be a higher monism, then it must surely be a monism of an idealistic, mentalistic or psychophysical type rather than a monism of a materialistic or purely physical type.

CONSIDERATION OF SOME THEORIES IN PARAPSYCHOLOGY

By K. Ramakrishna Rao

The scientist who is, at this stage, averse to accepting the evidence for ESP reminds us of the dogmatic professor of philosophy who refused to look at the planets through Galileo's telescope. It is a mistake, however, to think, as G. N. M. Tyrrell put it, that the human mind has been instinctively so adapted as to deal only with the world revealed by the senses and that consequently it is genetically prone to disbelieve in ESP. Rather, the human mind has from time immemorial kept pace with, and adapted to, the panorama of startling facts, however antagonistic they may be to its prior notions. It once even committed a "rape of the senses" by accepting the Copernican hypothesis. And presumably it would not hesitate to do so again when confronted with the fascinating facts of ESP if the parapsychologists could only put forward an intelligible explanation of these mysterious phenomena of the human mind. It is therefore of importance to seek a plausible theory that would account for ESP or at least to formulate a working hypothesis that would justify present researches and stimulate future work. As a first step forward in doing so, it is always interesting to see what has already been said regarding the *modus operandi* of ESP; and it is with this intention that the author proposes to review critically some of the published theories dealing with it.[1]

I

A Philosopher's Views on Telepathy

H. H. Price is one of those open-minded philosophers who accepted the theoretical challenge of ESP and sought to explain it.

Telepathy, according to Price, is not a form of knowing. Knowing, he says, has an "all or none" character. There is no inter-

[1] In the following pages no attempt is made to cover all aspects of ESP. The notable exclusion is precognition, since it involves many challenging notions that require lengthy and independent treatment. The reader who is interested in the theories of precognition may refer to the author's book, *Psi Cognition* (Tagore Publishing Housee, Tenali, India).

mediary stage between knowing and not-knowing; we either know a thing or do not. But in telepathy the percipient's impression may be partly true and partly false. Moreover, the percipient's experience seems to take no notice of the success or failure of his call. If telepathy is a form of knowing, there ought to be some difference in the experience when he calls the right card and when he calls the wrong one. Price says that he has no objection to calling telepathy a form of cognition. But he contends that telepathy is not knowing others' thoughts; rather, a telepathic experience is caused by a similar experience in others. "Telepathy," says Price, "is more like infection than like knowledge" (14).

The telepathic rapport observed by many investigators shows that individual minds have something in common. Price points out that the continuous telepathic rapport between two minds makes it foolish to argue for the plurality of minds. Between one mind and another there are no clear-cut boundaries. The division of minds is not "absolute and unconditional, either." The illusion of the individual mind arises out of the superficial nature of self-consciousness.

Price thinks that the unconscious portion of one mind may interact with that of another. Thus he is led to an assumption of the "collective unconscious." The collective unconscious which connects all the apparently individual minds is responsible for telepathic cognition. The collective unconscious, according to Price, is not an "entity" or a "thing" but a "field of interaction." Thus telepathy is possible because minds are not causally isolated entities. Unconscious events in one mind may produce unconscious events in other minds.

Price says that the human mind has developed a repressive mechanism which suppresses the continual flow of telepathic impact from one mind to another because there is a biological need for such a mechanism. Otherwise the thoughts, emotions, and feelings of all minds would be constantly received by everyone, and life would very likely become chaos, and action impossible. Psychoanalysts have indicated that the repressive mechanisms are partly in abeyance during the states of relaxation and dreaming. If telepathic influences are suppressed by similar mechanisms, they should come through more often in the same mental states. Price points out that in fact many spontaneous cases of telepathic nature occur during dreams.

The existence of a repressive mechanism, he says, is also suggested by the fact that most mediums enter into a state of dissociation which releases the functioning of their abilities (13).

Price also makes a suggestion regarding the explanation of clairvoyance. He says that the unconscious part of our minds may be capable of perceiving everything, however remote in space, for the simple reason that the unconscious may be in contact with all things. But we do not see all things at once because the nervous system and the sense organs may be preventing us from doing so; and this process is, of course, biologically relevant to us. Occasionally, however, when the physiological mechanism allows it, these unconscious contacts may actualize themselves in the conscious in the form of psi experiences.

Price's theory leaves the essential intricacies of the *modus operandi* of ESP unexplained. His suggestion about the causal interaction of the unconscious portions of our minds is helpful in explaining telepathy, but Price does not explain in a detailed way the nature and implications of such an interaction. His contention regarding the repressive mechanism is not new, for others, beginning with Bergson (1), have advocated a similar conception. An important omission in Price is that he does not seem to suggest any clue to the mysterious riddle of the "selecting process" in ESP; that is, how one is able to select a particular telepathic communication out of the numerous impacts that are constantly present in the unconscious. It is difficult to conceive how the repressive mechanism serves as a selecting agent.

II

Compound Theory of C. D. Broad

C. D. Broad uses the concept "paranormal" to include such psi phenomena as clairvoyance, telepathy, precognition, and psychokinesis. According to Broad, there are certain synthetic principles which help to integrate various aspects of human experience. These he calls the "basic limiting principles." An event is paranormal if it seems *prima facie* to conflict with any of these principles. For instance, a clairvoyant event is paranormal because it contradicts the basic limiting principle that: "It is impossible for a person to perceive

a physical event or a material thing except by means of sensations which that event or thing produces in the mind" (5).

Broad's definition of the paranormal is one of the most analytical definitions in the field of parapsychology, but one wonders if it is not simply a negative description of what the paranormal is not, rather than a positive assertion of what it is. However, this criticism should not belittle the importance of Broad's analysis since what we know of psi is indeed precious little.

As early as 1925, Broad put forward a hypothesis to explain the mind-body relation (4). Convinced, as he is, of the possibility and the reality of psi as revealed in the spontaneous material and the phenomena of trance mediumship, he directed his hypothesis not only to explain the mind-body relation, but also to accommodate for the paranormal and the possibility of survival. According to this hypothesis, which he calls the "compound theory," the mind is not a single substance. It is a compound of two substances, and neither of them by itself has the characteristics of mind. These two substances, as he called them in 1925, are the "psychic factor" and the "bodily factor" (4). In his *Examination of McTaggart's Philosophy* (2), he called the former the "psychogenic factor," and in his more recent California address, "Human Personality and the Possibility of Its Survival" (3), he calls it the "Ψ component."

Such acts as perception, reasoning, and remembering are not the functions of either of the factors by itself. Just as a chemical compound possesses characteristics that do not belong individually to either of the constituents, the functions of the mind are not to be found in either of its constituent elements.

Broad goes on to say that the psychic factor could persist even after the cessation of the body after death. When a psychic factor is united with a body, it functions as a mind. So a discarnate psychic factor will not have consciousness. But when a psychic factor is united with a body, certain traces are formed. If it so happens that a psychic factor after its dissolution from the body with which it has so long been associated comes into contact with any one of the living organisms, as would be in the case of an entranced medium, the newly formed mind of the medium may, in virtue of the impressions this psychic factor had in the form of traces, recall the experiences

of the deceased person with whose body the psychic factor had an occasion to associate.

It is possible to extend this hypothesis and argue that the psychic factor has also the ability to psi-cognize or psi-kinetize without being conscious of their effects. However, we then have to assume that the psychic factor goes out to reach for the object or thought in psi cognitive operations or that it is in constant touch with all things and thoughts at all times. If we assume the former, we have to argue that when a thought, memory, or an experiential event is extrasensorially transferred from one person to another, as in telepathy, the psychic factor in the mind of the former must have come into contact with the body of the latter replacing its mind temporarily. But this could be possible, so far as we know, only if one of the persons involved in the situation were deceased or if he temporarily lost his mind or were at least in the state of deep sleep. That this is not the case in successful ESP experiments and even in some spontaneous cases argues against the plausibility of this alternative. If we admit the second possibility, that of universal and ominiscient ESP, there would be no need for any traces in the psychic factor in order to recall the experiences, since it is actually in touch with all that is.

It is interesting to note that the logical *modus operandi* of psi as could be deduced from Broad's compound theory is practically the same as Rhine's hypothesis of 1934 wherein he speaks of the "going out" function of the mind.

III

Radical Positivism and the Association Theory of Telepathy

Whately Carington sought to formulate a working philosophy of psychical research which he styled "radical positivism." His fundamental postulate is that what is meaningful must be verified by sensation or introspection. He says that an analysis of our perceptions reveals to us that the real or the meaningful in them is only sense data. Hence the real are the sense data which he calls "cognita." Carington now proceeds to put forward a novel conception of the mind in terms of cognita and cognitum sequences. He argues that to regard the mind as something other than the sense cognita is

entirely metaphysical and has no meaning. "The mind," he says, "is an immense assemblage of discrete particles" (9). Individual minds are the "condensations" formed of cognita. They are not completely "discrete" and "isolate," but are so formed as to possess a common something which may be called the common unconscious or subconscious (9).

Carington thinks that this new conception of mind affords a simple and meaningful explanation of the perplexing phenomenon of telepathy. When two or more individuals are faced with similar circumstances they are likely to have similar thoughts or mental images. For example, two persons looking at the sea or thinking about it are likely to imagine boats, waves, or beaches. In a telepathic experiment the agent concentrates on a target (for example, a picture). The idea of this target is probably associated with various thoughts and ideas about the telepathy experiment. The percipient is likely to have similar thoughts and ideas. Now, granted that the minds of the agent and percipient are related in the common unconscious or subconscious, it is likely, says Carington, that the idea of the target will be brought to the percipient's mind because of its association with the idea of the experiment in the agent's mind Carington argues that the principle of association of ideas renders this view plausible (7).

He advances the following line of reasoning in favor of his association theory of telepathy. It is demonstrated by Soal and his associates that the subjects in a telepathy experiment can do well with particular agents alone, which means that the subject and the agent have something in common that binds them together. This implies that there are close bonds of association and similarities between the minds of the percipient and his agent. This is evident also in spontaneous telepathy which usually occurs between near relatives and close friends who have common interests.

Carington introduces the concept of "K-ideas" to render the association theory of telepathy more intelligible. The K-idea is a connecting link, or an associative bond, between the agent and the percipient. The greater the number of K-ideas, the greater would be the probability of success in telepathy experiments. Carington explains the function of K-ideas by the following analogy. If an individual who is sailing in a boat wishes to send a heavy object to

a person who is in another boat, he would naturally tie a rope to the object and throw the free end to the other boat. Now, the two boats are like the minds of the agent and the percipient; the rope is the connector or the K-idea, and the tying of the rope is the formation of an associative bond (7).

The association theory lacks adequate experimental evidence to show that the increase in the strength and number of K-ideas necessarily increases the rate of scoring in ESP experiments. Soal and Bateman (18) have experimented with Mrs. Stewart, a very successful subject, in order to test this implication of Carington's theory. They presented Mrs. Stewart with a photograph of the agent and later with a detailed sketch of the objects in the agent's room to increase the strength of K-ideas. The results of these experiments (the Cambridge-Richmond distance series) were statistically insignificant, and the most that can be said is that they failed to strengthen Carington's theory. The enormous success recorded in certain other card-guessing experiments, which did not appear to foster the formation of associative bonds between the agent and percipient, also stands against Carington's theory. Finally, Carington's theory gives no explanation for the clairvoyant mode of ESP, though Carington himself considered that it is inherently impossible to distinguish between telepathy and clairvoyance (8).

IV

Tyrrell's Theory of the Subliminal Self

According to G. N. M. Tyrrell, human personality at the conscious level is a special adaptation to a certain kind of life steered by the senses. Psychical experiences (ESP, etc.), as well as clinical psychology and mystical experiences, suggest a region of human personality beyond the conscious. This unconscious portion of our personality, which is capable of receiving telepathic and other extrasensory types of communication, is what Tyrrell, along with Myers, calls the "subliminal self" (22).

Telepathy, according to Tyrrell, consists in some sort of cognitive relationship between the subliminal selves of two individuals. "The subliminal or extraconscious region of the self," he says, "contains an enormous range of things, high and low, transcendental and

trivial. All are obliged to pass through the bottle-neck at the threshold if they are to reach the normal consciousness, and in doing so, all make use of the principle of mediation by means of constructs" (23).

Now, according to Tyrrell, the communications and perceptions received at the subliminal level are pushed into consciousness in a symbolic guise or in a distorted form as a mental image or the like. The "tools" by which the unconsciously received psi cognitions are externalized in consciousness are called by Tyrrell the "mediating vehicles." These vehicles include dreams, sensory hallucinations, automatic writing, mental images, or strong emotion. Tyrrell rightly attaches great significance to this process of mediation. In telepathic dreams, the unconsciously received telepathic contact is exhibited in the same way as the content of normal dreams (21).

In psi cognitions, according to Tyrrell, human personalities are able to overcome the space-time barriers because the subliminal selves, which enter into paranormal cognitive relations, do not exist in space and time. Subliminal selves do not exist in the world of our sense perception but "elsewhere" where space and time have no domain.

Tyrrell says that he can give no clear description of this "elsewhere." He argues that language is incompetent to deal with things like this. Even as to the nature of subliminal selves he gives no lucid description apart from believing in their existence. He writes: "Extrasensory faculty may result from the circumstance that subliminal selves are neither singular nor plural; neither one nor many in their nature, but simply inconceivable" (22).

Tyrrell's views regarding the *modus operandi* of telepathy may be summarized as follows: In a telepathic cognition, the subliminal selves of the agent and the percipient are in a kind of relationship so that the subliminal self of the percipient has a "propositional awareness" of the agent's subliminal impressions. Telepathic cognition results if the percipient's subliminal awareness regarding the agent is manifested in the consciousness of the percipient by means of a mediating vehicle.

Tyrrell's theory is based on many unwarranted assumptions. His exposition of the nature of the subliminal self is ambiguous and vague. Even granting the reality of subliminal selves, we fail to see how these subliminal selves enter into that relationship by virtue of

which one *self* can have the propositional awareness of another's subliminal impressions. His conception of the unknown "elsewhere" sounds mystical and does not provide any plausible explanation for the transmission of subliminal impressions from one *self* to another.

The major contribution Tyrrell made consists in his re-emphasizing the process of mediation. His conception of mediating vehicles and his contention that both telepathic dreams and normal dreams exhibit the same form in externalizing the unconscious contents promises a new and important field of ESP research which might unravel the complexities of this mystifying phenomenon of the human mind.

V

Jan Ehrenwald and the Psi Level of Personality

Freudian analysis of human behavior has emphasized how the picture of reality may be distorted by instinctive drives and complexes. Freudians have recognized the subliminal forces of the personality. Their conceptions of the unconscious and the id are much nearer to the idea of psi-functioning than most other concepts of human personality. As the psychoanalysts postulated the id-level of functioning, so Dr. Ehrenwald, a psychiatrist himself, seeks to explain ESP by conceiving of a third level of personality functioning which he calls the "psi-level" (**10**). According to Ehrenwald, psi is a particular part of psychic reality, as is the id. The familiar laws of nature, with their dependence on space and time, which govern the personality at the ego- and the id-levels are not applicable to psi-functioning. Ehrenwald says that "psi is a medium common to all humanity whether or not we are aware of it."

He suggests two important factors that determine the manifestation of psi impulses in consciousness: (1) Impulses of high emotional tension are more likely to manifest in consciousness than those of lower emotional tension; and (2) the greater the degree of intellectual organization and complexity, the less is the likelihood that these impulses will break through the barriers that separate the psi from the ego.

Ehrenwald's conception of the psi-level of personality functioning has very little to say regarding the *modus operandi* of ESP. It par-

ticularly fails to render intelligible the process by means of which telepathic or clairvoyant impressions are received at the psi-level.

VI

J. B. Rhine's Theory

This less known hypothesis rests on two assumptions: (1) That some agency of mind which can function to some extent independently of the physical world is operative in ESP; and (2) that this agency has the capacity to "go out" to meet the object which is outside the organism it occupies.

According to Rhine (**15**), psi phenomena suggest the existence of mind that under certain circumstances and to some extent can function independently of the physical limitations of the material body. Relation to space has been considered an invariable characteristic of physical operations. All our perceptual experiences, as far as they relate to the material world, are organized into the framework of space. But with regard to ESP, space apparently has no influence, and the inverse square laws, etc., are inapplicable to it, for no reliable relation has been found between the distance of the percipient from the target or agent and the success or failure of the percipient's calls in ESP tests. In view of this strange phenomenon and of the evidence of precognition, unknown to the physical world, Rhine goes on to suggest, there might well be some other energy, one peculiar to mind, which is radically different from material energies. He considers that the source of these distinctive results must be sought in the nature of the mind capable of such effects.

Further, the success in ESP experiments is relatively independent of the nature of the thing to be cognized. It does not make any difference to the percipient's success whether the target of his guess is something material like an ESP test card, or a thought, as in the case of pure telepathy. Several outstanding subjects in ESP experiments have averaged about the same in telepathy and clairvoyance tests. Thus, in ESP experiments, successful results are obtained with a diversity of stimulation, ranging from a material object to a mental image and even to an object that will exist only at a future time. In sensory experience, on the contrary, we find different stimuli giving rise to different types of experience. Hence, argues Rhine,

the only way to render these facts intelligible is to recognize the need of a mental function capable of action independent of the limitations that define physical reality.

Rhine goes on to make another important suggestion. He says it appears that the mind "goes out" to perceive extrasensorially. It is not that the mind receives the different patterns of energy emanating from the objects in order to interpret them but that the mind of the percipient takes the initiative in ESP. Thus the mind's relative independence of the material universe consists in this appearance of mental causality, which is supported by the observation that space and time have shown no limiting effect on psi ability (**15**).[2]

In later publications—for example, in *New World of the Mind* (**16**)—Rhine considers the possibility of a mental energy operative in psi phenomena, an energy not subject to the familiar conditions of space-time-mass that identify and belong to *physical* reality. This energy, like the more familiar energies, is convertible to other forms, and in this way its operations can be detected by its secondary effects. The cognitive (ESP) effects of psi result from converting parapsychical energy to the physiological energy of the brain system; the psychokinetic effects of psi result from conversion of parapsychical energy so that it acts on a material system, such as rolling dice. The question is left whether psi may not operate in an energetic order that in itself has no space-time. Rhine emphasizes the unifying interaction of the mind with the physical world, even while calling attention to the valid distinctions parapsychology has established.

VII

The "Shin" Theory of R. H. Thouless and B. P. Wiesner

The hypothesis of Thouless and Wiesner (**19**) starts from the similarity between the normal and paranormal processes, and suggests that these two processes are not radically different and that in either case no unusual entity is operative. There is no actual representation of the cognized object in either psi cognition or normal sense perception. In all the spontaneous manifestations of ESP, the

[2] Rhine has offered these suggestions only tentatively in his first book, *Extrasensory Perception*. But this hypothesis represents a dominant trend in parapsychical speculations.

symbolic or distorted representation of psi cognitions is evident. In normal sense perception also the image of the object that is cognized is not perceived directly. It is true, of course, that the content of a cognition resembles the object in most cases, but the immediate causal antecedent of our sense perceptions is not the object but the nervous system and the brain. Hence, both psi cognition and sense perception are but the results of processes in the brain and the nervous system.

"In normal thinking and perceiving," Thouless and Wiesner say, "I am in the same sort of relation to what is going on in the sensory part of my brain and nervous system as that of the successful clairvoyant to some external event, and that this relation is established by the same means" (19). In an act of perception, according to their view, we are not aware of the immediate cause of our perceptions, the cause being the changes in the brain and nervous system. So also, a successful clairvoyant is not aware of the object of his cognition, which is the immediate "causal ancestor" of his cognition. Then normal perception differs from clairvoyance in that the former is mediated by the brain and nervous system. In the case of clairvoyant perception a direct contact between the subject and the object is established.

Shin and Psi Cognition

Thouless and Wiesner (along with some of the nineteenth century thinkers, notably Braid) assume that there is some entity which is involved in our processes of volition and perception, which they call "Shin." Shin is almost like the soul, but they prefer to avoid the usage of the concept "soul," as it carries a certain connotation which is partly outside the field of parapsychology. Shin is always operative in sensory as well as extrasensory cognitions. It is constantly being informed of our sensory perceptions. Its cognitions are received from the perceptual side and its volitions are activated on the motor side. In normal perceptions, Shin is mediated by the brain and nervous system, and in psi cognitions, such as clairvoyance, it is directly connected with the object.

Sensory stimuli emanating from the object act on the sensory part of the nervous system. Shin is informed by the processes in the nervous system, and, in turn, Shin controls the motor part of the

nervous system. On the other hand, in the processes of clairvoyance, direct connections are established between Shin and the object, without the intervention of the brain and the nervous system. Thus psi cognitions are not supernormal, but, as Thouless and Wiesner put it, are "exo-somatic forms of processes which are normally endo-somatic."

Thouless and Wiesner define telepathy as a "process of Shin acting on, or being acted on by, a nervous system other than its own." In every normal act of perception Shin is informed of the processes in its own nervous system. Thouless and Wiesner suggest that it might so happen sometimes that Shin develops contacts with some nervous system other than its own and is thus aware of processes of that other nervous system. Telepathy, then, would be like any other process of perception except that it would involve cognitive relations with a nervous system which is outside the body in which Shin is residing.

Thouless and Wiesner point out that a volitional effort in ESP tends to inhibit success. They seek to interpret this in support of their hypothesis. Thus they argue that the volitional efforts put forth are likely to direct Shin activity to the habitual sensory modes of perception and, consequently, prevent Shin's direct contact with the object. This is, however, a questionable argument. Many successful clairvoyants, particularly mediums, claim to exercise a lot of volitional effort to achieve success. Miss Johnson, who showed ESP to a marked degree, did this "successfully, but not without great nervous strain," says Tyrrell (**20**). Rhine's brilliant subject Pearce scored all the twenty-five cards when Rhine goaded him by betting on the outcome (**15**). Thouless and Wiesner think that the action of the nervous system may inhibit psi-functioning. But volitional effort need not put the nervous system into action; on the other hand, it may control its activity. As pointed out by Craig Sinclair, concentration and relaxation may be equally necessary for success. Mrs. Sinclair means perhaps the same when she says, "a part of concentration is complete relaxation" (**17**).

The hypothesis of Thouless and Wiesner is essentially a development of Rhine's. However, this is disguised by their use of the term "Shin" and their failure to touch upon an important implication of their Shin theory. They say that the direct contact of Shin

with the object, without the mediation of the brain and the nervous system, is the necessary condition of clairvoyant cognition and that the direct contact of Shin with the brain and the nervous system other than its own is telepathy. Now it may be asked How is the percipient's Shin able to reach the object which is outside the body it occupies? The laws of causation do not permit us to assume that Shin sits inside and yet is capable of perceiving distant objects without any causal connections in between.

C. D. Broad's analysis (6) of causal objection to precognition applies *mutatis mutandis* to the Shin activity. Therefore it is evidently impossible for Shin to perceive objects unless the radiating patterns of energy emanating from the object are reflected without sensory aid on Shin, or Shin is assumed to be capable of forcing itself on the objects external to the organism and extending in space, without itself being subjected to the laws of space. The known laws of nature render the first alternative impossible. Hence, the only way to make the operation of Shin in psi processes consistent with the known order of reality is to assume that Shin, a part of it, or an agent of it goes out to the object to perceive extrasensorially.

This is essentially what Rhine means when he says that the mind or an agent of it "goes out" to perceive extrasensorially (15); or, alternately, when he later adds that the mind may function through an energy form not conditioned to time-space-mass relations (16). The difference between Rhine and Thouless consists in the use of different terms, "mind" and "Shin," and perhaps Thouless and Wiesner are justified in giving currency to the new term "Shin" since it is not vitiated by any previous metaphysical connotation, as is the case with the term "mind."

VIII

Flew's "Guess Work"

Antony Flew expresses his concern over the "mind talk" of some parapsychologists that their findings provide evidence for metaphysical dualism (11). This, according to him, is "philosophical sensationalism" which is due in part to the misunderstanding of the "logic of terms" in which psi is popularly described, and partly because of the setting up of inappropriate explanatory models. Flew

directs his comments especially against Rhine whose "mind terminology" worried him considerably. He complains that Rhine "misconstrues its logic" by thinking that the mind is a kind of object, something more than human capacities, feelings, and aspirations. For the readers of this *Journal,* Dr. Rhine does not stand in need of any defense, for he never meant by mind, as far as I can see, an objective entity distinguishable apart from its functions. I am sure that Flew would not deny that some of these functions seem to defy the known laws of space and time. I must confess, however, that some of Dr. Rhine's own statements can be easily miscontrued to indicate a naive metaphysical dualism which I abhor no less. That this is not a correct expression of his views is evident from many statements he has since made. Those who are not still convinced of this may profitably refer to his editorial in the December, 1945, issue of this *Journal.*

The concept of ESP, Flew argues, suggests an explanatory model of perception, but ESP is very different from perception in essential respects. He goes on to say that such paradoxes as Dunne's concept of time are patently due to taking seriously the perceptive models of ESP. If we cannot explain ESP on the model of perception, how else could we do it? Flew thinks that it is more fruitful to consider ESP as a "species of guess work" (11). But one fails to see, even granting an explainable connection between the subject's guesses and some other psychological factors associated with it, what purpose this new model would serve for ESP. As Mundle succinctly points out, Flew's "guess work" model could neither *describe* nor *explain* the facts of ESP any more appropriately than the perception model of the parapsychologists (12).

Discussion

It would appear that each of the theories discussed above finds it necessary to assume a hitherto unknown "entity" operative in all our psi cognitions—whether it be the collective unconscious, subliminal self, mind, or Shin—which is capable of breaking through the barriers of space and time. Moreover, its extrasensory awareness ("propositional" or "perceptual") of objects or of thoughts and the processes involved in its operations fall beneath the threshold of the subject's consciousness.

If the assumed entity is isolated as well as distinct from and independent of human personality, the problem arises: How does this entity interact with conscious personality so as to manifest its nonsensory awareness of objects in consciousness in the form of images thoughts, etc.? No known analogy provides any basis for the solution of this problem. However, if the functions of the assumed entity are ascribed to some portions of personality, the problem becomes simple and an intelligible solution is possible. As Tyrrell (21) suggests, the "mediating vehicles" such as dreams, automatic writing, sensory hallucinations, etc. may be regarded as analogous to the repressed consciousness—as the "tools" by which ESP impressions are mainfested in consciousness. In this context, Jan Ehrenwald's conception of the psi-level of personality functioning seems very significant (10).

An important problem on which the aforesaid theories seem to disagree concerns the way in which extrasensory perceptions are received at the psi-level. There are two important views regarding the operation of the psi personality: (1) that this portion of our personality is in touch with all objects, however remote they may be in time and space; and (2) that it has the ability to function independently of the body and to extend itself in space without itself being subjected to the laws of space. The first view leads to two serious consequences. First, if the personality is in touch with all objects, how is it that we are able to know so very few things extrasensorially? It is commonly said that human beings have developed a repressive mechanism which prevents them from knowing extrasensorially. However, it remains to be seen how, if it exists, this repressive mechanism operates. Secondly, it has to be explained how the subject in a card-guessing experiment is able to hit the target which is one among twenty-five similar cards. It is pointed out that the desire of the subject may be responsible for the selection of the target card. But desire and will are functions that, so far as we know, belong to the brain and nervous system and not to a distinct psi function. Further, some investigators have observed negative ESP effects, although their subjects exercised their will to guess the right card.

The second view, however, does not entail these difficulties. The relaxation of the brain and nervous activity is conducive to ESP

success because the psi division of the total personality is at liberty to initiate contact with the desired object. Or if space and time do not exist for the realm of purely mental energetics, there is no "travel" to be done, as there is no separation.

But if psi is considered an aspect of personality, it is no more nonphysical than man himself, and it is as much physical as his personality. Psi function is then not any more different from other aspects of personality than an atom is different from a molecule or an electron from an atom. We would seem to have overstated our case when we stress the nonphysicality of ESP. On the one hand, if by nonphysical we mean something different in certain respects from what is *merely* regarded as physical, just as memory is different from the function of an electronic brain, there would be no dispute about it. But that this is not the sense in which it is used is fairly obvious.

On the other hand, if we mean by nonphysical something nonmaterial in the sense of possessing no known characteristics of such psychological functions as perception, thought, and desire, our assumption would seem to be quite contrary to the spirit of investigations which are solely designed to find out the physical, physiological, and psychological conditions that would help or hinder the manifestation of psi. We may not know precisely what psi is; but surely it is something that happens in a physical world and is known through physical media. Whether or not psi fits into the world we know, it is something inescapably "co-extensive" with the physical world.

I am sure that this is a fairly obvious position, and many parapsychologists do not dispute its truth, even if they hold that psi is nonphysical. The controversy, it seems to me, is wholly due to the misuse of certain concepts. And what we need in parapsychology today is a close examination and scrutiny of the parapsychological concepts. Philosophers would contribute a great service to this infant science, if, instead of throwing in ideas that make a mystery out of a muddle, they would help to organize a conceptual framework within which the parapsychologist could paint the picture of his fascinating field.

A moment's reflection, for instance, would show how, once we assume that psi is nonphysical and nonsensory, we land ourselves in paradoxes and confront formidable questions. The physical nature

of man, as far as his cognitive aspect is concerned, consists in his dependence on the senses for any information about the world external to him. It is claimed that psi is nonsensory. The absence of any need of orientation, the failure to locate any other sense, and the lack of any known stimulating energy have been considered to indicate its nonsensory nature. And the alleged ineffectiveness of time and space is regarded as conclusive proof that psi is nonphysical. It may be noted, however, that the absence of the need of orientation etc., does not warrant the conclusion that psi is nonsensory or nonphysical. It is not antecedently improbable that the function of the senses and the nervous system are different from what we know of them in normal modes of sensory communication.

If psi is considered to be devoid of any relation to the human senses, some formidable questions arise. The colors, sounds, etc., are not inherently present in the objects themselves. They depend on our modes of cognition for their existence. Now, if a percipient in a clairvoyant experiment is assumed to come into direct contact with the object, and the senses have no function whatsoever to perform in the whole process, would not the objects in such a situation appear differently, i.e., without color, etc.? The question whether there could be any psi cognitions without the appropriate senses is interesting and one that it is worth while to investigate. Can a man who was born blind record equal success on visual as well as auditory targets?

All figures involve space relations, and ESP subjects have been found successful with figures as their targets. Would it not then involve us in a contradiction to assume that pictures and figures can be known by a process to which space relations do not make any sense? If space is unreal in the region of psi, can any subject make any possible distinction between a *square* and a *cross* in a pack of ESP cards? It is reported that caffeine has a positive effect and sodium amytal a negative effect on ESP scoring. What does this mean? Does it not mean that better results could be obtained by physically stimulating the organism and that physiological processes have a significant role to play in the functioning of psi? If fatigue is detrimental, relaxation conducive, and motivation essential for psi success, cannot we expect to understand, if not account for, psi by means of certain known concepts?

Most of the nonphysical hypotheses seem to stem from an argument somewhat similar to the following. Psi is either physical or nonphysical. If it is physical, it is subject to the known physical laws. Since psi cannot fit into the framework of the known order of nature, it is nonphysical and can be explained only by assuming a nonphysical entity operating within and influencing the physical world. The main function of this nonphysical entity is to provide us with a means of over-riding the physical limitations of the physical laws. Consider, for example, the alternatives of a possible cognitive relation between the subject and its object. In order that there could be a cognitive relation between the subject and its object, either the object should be capable of forcing itself on the subject, or the subject itself should be able to reach the object, or the subject and the object should be in continuous contact with each other in virtue of the fact that they are parts of an interrelated system.

The first alternative would amount to a "physical" hypothesis. Since the object in a clairvoyant situation is avowedly a material something, the only way it could make its impact felt on the subject is to emanate energy patterns that could be received by the subject. Since no such energy pattern which could travel in any known medium is discovered, this hypothesis would seem to be far-fetched. In the second alternative the subject is assumed to be capable of forcing himself on the objects external to him and extending in space without his being subject to the laws of space. We find a number of hypotheses based on this assumption throughout the literature of parapsychology. For example, Dr. Rhine suggested in his very first book that the mind or an agent of it "goes out" to perceive extrasensorially. He argues that the mind's relative independence of the material universe consists in its "going out," and it is this "going out" that makes space and time more or less ineffective. It is obvious how an impassable gulf is created between the mind and matter in order to account for the relation between the subject and object in a situation where there is perfect harmony between the two even granting the dichotomy. The third alternative, instead of endowing everyone with this mysterious agency, postulates one universal nonphysical something in which all the physical things can participate and share its potentialities. A typical example is H. H. Price's hypothesis of a "collective unconscious." He thinks that the collective

unconscious is a "field of interaction" where minds meet to exchange information. It may be possible, he argues, that our minds are in contact with all things, thus enabling us to perceive everything. It is evident how Price is endeavoring to relate the subject and the object to explain a physical relation in a nonphysical way.

It would seem that this way of looking at psi leads us nowhere. Firstly, the question whether psi is physical or nonphysical does not seem to throw any light on its nature. And secondly, it is paradoxical to consider psi as a species of perception and at the same time nonsensory. There is no evidence that psi involves perceptual awareness. If this is agreed upon, one need not look for the transmission of waves, or the establishment of nonphysical relations between the subjects and their cognitive objects. Nor is there any evidence that psi is nonsensory.

If we ignore the physical-nonphysical dualism, one may wonder how we could possibly define parapsychology, as most of our theoretical talk has assumed this dichotomy, more or less. It seems to me that an essentially functional and naturalistic definition is possible and would be fruitful at this stage of parapsychology. We deal in parapsychology with behavior. We assume that it is observable and measurable. May not we, then, define parapsychology as a branch of psychology which deals with those aspects of cognitive and kinetic behavior that do not seem to involve any hitherto known modes of sensory participation? We may find one of these days, if we can trust the yogic practices, that psi is after all a function of and is generated by the exercise of primordial imagination.

In concluding this paper, I want to make it clear, in the first place, that I am not arguing for the *physicality* of psi. To do so is quite contrary to the position I have taken in the preceding pages. I do not see how we could, at this stage of our research, meaningfully define either physicality or nonphysicality in relation to psi without making dubious assumptions that lead us to paradoxical positions.

In the second place, my reference to imagination should not be construed as a hypothesis I am prepared to defend, even though psi, in its cognitive aspect, would seem to me more like imagination than perception. My purpose in bringing in imagination here is only to

show the inadequacy of perception as an explanatory model of psi cognitions.

In perception, the object to be perceived is an active agent. The size, color, and surroundings of the object affect perceptions. But this does not seem to be the case with psi cognitions, which, in this respect, are more like imagination. We know that excessive imagination, at least in certain cases, could produce hallucinations, day dreams, etc., which are also found to be the tools by which spontaneous psi cognitions are manifested. The perceptive model creates an artificial distinction between telepathy and clairvoyance which, on the model I am suggesting, would be imagination directed towards the thoughts of certain persons and towards objects and events respectively. But even if we can accept imagination as a closer parallel to ESP than perception, we have to recognize that it would be imagination plus something more than what that term ordinarily connotes.

Finally, if psi is more like imagination, there is no need to assume that psi is nonphysical, for the nonphysicalistic hypothesis derives its force from the perceptive model on which psi is unwarrantedly based. If the argument simply is that psi is nonphysical because it transcends space and time, then it can also be argued that psi is as much physical as thought and imagination, for you can imagine physical things however remote they may be in space and time.

But the nonphysicalists would argue, I presume, that psi is nonphysical insofar as it is perception and at the same time it transcends space and time, which makes it nonsensory and nonphysical. In other words, the whole force of the hypothesis that psi is nonphysical is based on the assumed similarity of psi to perception. But this is a questionable assumption.

Having said this, I must confess, however, that parapsychologists have the "right to believe" that their phenomenon is nonphysical if this has any useful consequences to them and if their position does not conflict with their actual findings or retard their experimentation. I have only tried to point out some of the logical difficulties this position would entail, and the undesirable consequences it may have on the planning and conducting of psi experiments. It is for the individual investigator to judge the fruitfulness or the uselessness of these suggestions.

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LETTERS AND COMMENTS

To the Editors,:

Re: Energy transfer in psychokinesis

The Pratt-Roll report on the Seaford disturbances (*J. Parapsychol.*, June, 1958) brought home very forcefully the great need for experimental studies of recurrent spontaneous psychokinesis (RSPK). Laboratory observation of RSPK appears to be beyond any reasonable hope in spite of the remarkable uniformity of "poltergeist" effects (as reflected for instance in *Haunted People* by H. Carrington and N. Fodor, N. Y., Dutton, 1951) during more than a millenium. Neither can there be much hope for the creation of induced poltergeist effects until such time as experimentally testable theories are put forth including (a) a consistent scheme of the psychological processes involved, and (b) a physical scheme of the necessary energy transfer. The present note concerns such a physical scheme.

Three characteristic manifestations of RSPK are (1) changes in the states of motion of bodies, such as sudden movements, (2) increase in the temperature of bodies, such as the warming up of liquid contents of bottles that were disturbed, and (3) noises. At the present we restrict ourselves to considerations of the first two manifestations.

It is generally considered by students of the subject (such as H. Thurston in *Ghosts and Poltergeists,* Chicago, Regnery, 1954) that RSPK is an attribute of the mind and as such its study is within the domain of parapsychology and psychiatry. The effects of RSPK, however, are of a nature which a classical physical scientist would consider to be "action at a distance." Items (1) and (2) in the prior paragraph define these actions as changes in the momenta of ponderable bodies and increase of heat content of liquids. Both changes are recognized as changes in energy, specifically as changes in the kinetic energy of an aggregate of particles. It follows that the effects of RSPK indicate expenditure of energy unless one is ready to take the self-contradictory position that not only the psychological but also the physical aspects of RSPK are nonphysical in nature.

Even a superficial review of the kinetic effects attributable to poltergeists indicates that the reported gross motions of bodies and increases in the temperature of liquids represent work of such magnitude as can not be conveniently accounted for by energy transfer through the process of electromagnetic radiation. As a consequence, the question of the possible physics of such transfers arises.

Differing with the conclusions of other students of general relativity that there is no localizable energy in a gravitational field, P. A. M. Dirac has shown recently ("Energy of the Gravitational Field," *Phys. Rev. Letters,* vol. 2, 1959) that the gravitational field of an accelerating mass does contain energy travelling radially outward. It is within reason to extend this argument to an aggregate of oscillating particles and conclude that they also radiate power. By an argument of symmetry, a suitable aggregate of particles should be capable of recovering the transmitted power or part of that power in the form of kinetic energy. Upon absorption, the power can appear as increase in heat content or change in kinetic energy, depending on the structure and, perhaps, on the state of motion of the receiver.

It seems that the development of the Hamiltonian form of gravitational theory that enabled Dirac to conclude the presence of well defined energy in gravitational waves ("Fixation of Coordinates in the Hamiltonian Theory of Gravitation," *Phys. Rev.,* vol. 114, 1959) offers a suitable framework for handling the problem of radiative kinetic energy transfer.

It is important for parapsychologists to take note of this development, for later work may bring within the experimentally testable realm the moving of a body from a distance.

The general PK theory that is being suggested defines RSPK as subconscious volition for kinetic energy transfer in agreement with Andrew Lang (as cited by Thurston, *op. cit.* p. ix). The introduction of a physical model for the second half of the definition does not obviate the parapsychic nature of RSPK any more than studies of electromagnetic radiation in the visible spectrum obviate the creative genius in fine art. In our model the strange nature of RSPK is clearly attributed to the unknown workings of the unconscious.

While the suggestions in this note appear to be self-consistent, it is necessary to emphasize that the application of an untested

physical theory in combination with an assumed psychological process to form, in concert, a parapsychological scheme is highly speculative.

It is a pleasure to thank Mr. I. A. Greenwood of Stamford, Connecticut, for his helpful criticism of the first draft of this letter.

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To the Editors:

I wonder if the readers of the *Journal* would be interested in an experiment which my brother, A. J. Good, suggested to Whately Carington in correspondence in 1946, but which, as far as I know, has not yet been performed. In the ensuing correspondence, Carington expressed approval, but unfortunately he died the next year.

A man is placed in a dark room, in which a light is flashed at random moments of time, the interval between flashes having an exponential distribution (i.e., the distribution between emissions from a radioactive source for example). The man's EEG (electroencephalogram) is recorded on one track of a magnetic tape, and the flashes of light on another. The tape is then analyzed statistically to see if the EEG shows any tendency to forecast the flashes of light. The experiment would have five advantages over card-guessing experiments:

(i) It would be easier to be sure that recording errors had been eliminated.

(ii) A precognitive interval might be revealed that would be too small to be noticed by means of ordinary card-guessing experiments.

(iii) It would be possible to detect unconscious precognition by the percipient.

(iv) The evidence might be acquired at a great rate, before the percipient became bored.

(v) The experiment strikes out in a new direction, whereas several card-guessing experiments have already been done. For all we know, the experiment might be successful with a large proportion of percipients, even if they had not been specially selected.

In a letter from Dr. D. J. West to my brother, West said he hoped to try the experiment as soon as he had found a suitable percipient. Since then he has found a promising candidate (see "A Mass ESP Test Using Television," by S. D. Michie and D. J. West in the *J. of the Soc. for Psychical Research,* Vol. 39, 1957, pp. 113-33), who, however, became bored with the card-guessing experiments before the EEG experiment had been laid on.

In 1951, I suggested this EEG experiment to Dr. Grey Walter of the Burden Neurological Institute, Bristol, at a meeting of the informal Ratio Club, but his subjective estimate of the chances of success were too low to justify his making the effort. In correspondence, Dr. J. A. V. Bates of the Neurological Research Unit of the Medical Research Council, in 1951, suggested as a simpler alternative experiment that the percipient should tap a key when he thought the flashes were imminent. This method would have some advantage, but would lose advantage number (iii) and some of (ii).

Since, during the last fifteen years, my brother has failed to provoke an experiment, he has given me permission to publish his suggestion in the hope that it will reach an experimenter who is prepared to make the effort.

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BOOK REVIEWS

WILLIAM JAMES ON PSYCHICAL RESEARCH. Compiled and edited by Gardner Murphy and Robert O. Ballou. New York: The Viking Press, 1960. 338 pp. $6.00.

Dr. Murphy introduces the collection of James' writings on psychical research by a brief but insightful sketch of the James family background with its intellectual interest in unorthodox beliefs, and also an account of William James' long struggle with illnesses that disposed him to look for psychological aid. This background favored James' attention to those unconventional claims and practices that have to do with healing and religion. It was only natural, then, that the coinciding of his period with the rise of the Spiritualist movement would draw his attention seriously to the claims of mediumship.

Most of the pages of this collection of writings deal with mediumship and the problem of post-mortem survival. The most important of these is James' report, published in 1909, of his study of the mediumship of Mrs. Piper following the death of Richard Hodgson. This study was especially important because it brought James closest to the point of judgment of the case for survival. It was here that he was forced to say, "I remain uncertain and await more facts. . . ."

Other important writings by James are included in two later chapters, one on Frederic Myers and one on religion and the problems of the soul and immortality. Then, as a natural and fitting climax in the final chapter, there follows the now almost classic article which first appeared in 1909, "The Final Impressions of a Psychical Researcher."

In his restrospective evaluation, Dr. Murphy points out: "James did four important things for psychical research: First, he gave it a certain status, a certain intellectual respectability which only his own immense prestige could have given it in the United States in the era in which he flourished. Second, he played a major role in founding official psychical research in the United States, keeping it properly very close to the S.P.R. of London, but in an administratively

independent place which helped pave the way for a later independent American S.P.R. Third, he discovered the extraordinary mediumistic powers of Mrs. L. E. Piper. . . . Fourth, he presented a 'radical empiricism' regarding the position which a serious facer of facts must assume when what seems to be unassimilable data must somehow be faced, thought through, and correlated."

This book represents an important service to parapsychology at this stage. In fact, I hope it will serve as a model for a series of books of similar type on a number of the outstanding pioneers of parapsychology in this country and Europe. Until there are more courses in this subject and a good history or two, and even a few good teaching departments in the universities, books of this type will be needed to aid students to shape up an adequate perspective of the field and its problems.

There are some warnings to be mentioned, of course; there always are. Most psychical researchers of the James period were investigators of mediumship. The research front is so far from that today that the relevance of this material may be questioned. But, for one point, it would be well to remember that without the religious movement that generated interest in mediumship there would not likely be any parapsychology today. Curiously enough, the phenomena now accepted in parapsychology received comparatively more attention from the psychology of James' day *because of* their involvement in mediumship than they have even yet after all the controlled experimental work. It is often not realized by the student of ESP today that the scientific attention which has been given it was largely brought about and supported by interest in discovering to what extent telepathy and related abilities could provide a counterhypothesis to the spiritistic interpretation of mediumship. For William James and his contemporaries, a range of manifestations that would be considered in present terms "parapsychical" were collected and studied with a view to their bearing on the question of post-mortem survival. As the years of study have passed, however, it has become recognized that they may also be interpretable as due to the psi abilities of the person experiencing them. If, therefore, one is, like James himself, able to suspend judgment on the interpretation, he may profit from and enjoy the adventures of a pioneer in breaking ground—and even rougher ground it was then

than now—in a field the outlines of which are still only dimly discernible.

It is important to remember, too, that William James was in general more philosopher than experimentalist. His primary role was that of a teacher and a wise and judicious expositor; but the characteristic that most distinguished him was his complete independence of the orthodoxies of his time. For these qualities parapsychology is, as Dr. Murphy has indicated, deeply indebted to him.

Whether or not William James would, if he were living today, be a more productive experimental worker in the field than he was in his period, no one can say. There was, to be sure, a great deal less experimental science in the general psychology of his day. His own intellectual evolution, however, leads me to think that he would not, even today, be a grubby fact-finder in the experimental way that is so basicly important to the progress of a scientific field. Even in his study of mediumship he was a good judge but not an innovator; he was always a brilliant expositor but not an inventive explorer. He was gifted in summing-up but not given to testing-out. So, as the student of today reads his lucid exposition, he will have to furnish his own research impulse toward the active solution of the problems which still today, as when William James laid them aside, confront us as challenging unknowns.

There is perhaps something especially significant for us in the interesting but depressing comment James makes in his "Last Report." After summarizing a statement by Henry Sidgwick that after twenty years of psychical research he was in the same state of doubt and balance he had started with, James adds: "My own experience [after twenty-five years] has been similar to Sidgwick's." But I now make the judgment, harsh as it may seem to my fellow-admirers of these two great men, that had they been more ready to get out of their chairs and into the laboratory to find ways of focusing the issues by experimental test and to seek the evidence necessary to solve these problems, they would not have had such skimpy reports to make after twenty or twenty-five years.

Of course, not everyone needs to be an experimenter to help in the advancement of a science. We respect these men for the contributions they did make, which were very great indeed. But in our admiration we need not be carried away from the central point that

it was not they who found the solid facts on which the structures have had to be built. If we do not point out this distinction and emphasize the importance of experimental research, then the contribution and heritage of all our pioneers will be lost.

J. B. RHINE

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PARAPSYCHOLOGI. By Birger Qvarnström. Stockholm: Natur och Kultur, 1959. 368 pp.

In a series of books dealing with present-day psychology, the Swedish publishing house, Natur och Kultur, has brought out a scholarly and stimulating volume on parapsychology by Birger Qvarnström. His material is mainly drawn from S.P.R. sources with support from works in the German, French, and Scandinavian languages. The text is well spiced with quotes from spontaneous cases and experimental reports. The reader will also enjoy visits (very brief, unfortunately) to the main centers of contemporary experimentation and look in at such off-beat spots as Berg-am-Irchel castle where a poetic ghost dictated to Rainer Maria Rilke and Jersey Island where Victor Hugo had his literary sittings. The treatment of these and other exotic items is, however, always cautious. Unfortunately, Qvarnström is not equally on his guard when he discusses some apparently respectable experimental efforts (e.g., there is no mention of Scott's criticism of Hettinger's work).

When he leaves the main stream of scientific investigation, it is to draw examples for the book's principal theme: the organizing and dramatizing capacities of the unconscious and its role in shaping the subject's responses. This motif stands out especially sharply in the sections dealing with the "mediumistic" material. In his discussion of the tests with the S.P.R. subjects (which includes a good chapter on the cross-correspondences) he supports his conclusion that there is no evidence for survival both by arguments based on these researches themselves and by the material he brings in from such sources as literary creativity, hypnotic testing, and psychopathology.

The effect of unconscious factors in influencing ESP scores has been asserted forcefully by studies involving personality tests and

questionnaires where motivation has swung scores in either the positive or negative direction without the subject's conscious intervention. This material would have fitted well into Qvarnström's framework. But though he crosses space-, time-, and language-barriers, he has not reached the contemporary American scene. His only reference work is the quarter-century old *Extra-sensory Perception* by J. B. Rhine. This limitation severely restricts the usefulness of the book as an introduction and survey of parapsychology, especially the sections dealing with telepathy, clairvoyance, and precognition (PK is explicitly excluded as belonging to "paraphysics" rather than parapsychology).

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PARAPSYCHOLOGICAL ABSTRACTS

SARA R. FEATHER

[This section consists of abstracts of reports published in other journals and of unpublished reports filed at the Parapsychology Laboratory at Duke University. Readers may obtain unabridged copies (Thermo-Fax) of the unpublished reports by writing to the *Journal of Parapsychology,* College Station, Durham, N. C. The price is ten cents per page.]

CASSOLI, PIERO. Il series di esperienze di telepatia collettiva, eseguite nella città di Bologna (The series of mass experiments in telepathy conducted at Bologna, Italy). *Parapsicologia da Minerva Medica,* 1960, **51**, 1-12.

In order to duplicate as much as possible the conditions occurring during cases of spontaneous telepathy, the targets to be guessed by the percipients, scattered all over the town of Bologna, were *tableaux vivants,* pantomime scenes, in which the four or five agents were the performers. For instance, in one target scene the actors hammered with mallets on a table top on which pieces of glass were strewn; in another, the agents looked at a transparent x-ray photograph of a nine months old foetus in the womb, etc. The scenes to be transmitted were acted twice every time during a quarter of an hour, so that every percipient had a chance of attending. In all, 21 different scenes were transmitted as targets, and 288 guesses in writing were received by the experimenters. Of these only four were evaluated as "excellent"; i.e., reproducing literally one or more of the principal items of the target scene. Twenty-six guesses were listed as "good"; i.e., giving indications that approximately or in a roundabout way the percipient had a notion of what the target was meant to convey.—*G. Zorab.*

CORNELL, A. D., AND GAULD, A. A Fenland poltergeist. *J. Soc. Psych. Res.,* 1960, **40**, 343-58.

The authors report upon their joint investigation of the alleged haunting of Hannath Hall near Wisbech in Cambridgeshire, England, which they conducted in a total of twelve visits between No-

vember, 1957, and January, 1960. Under relatively guarded conditions, the investigators, alone in the room being investigated, heard repeated sharp raps from different locations in apparent code response to their questions, and noted that a chair behind them had somehow moved and fallen a distance of five feet. Under the most carefully guarded conditions with three additional investigators checking the movements of all persons in the house, muffled knocks were still heard emanating from the bedroom floor. Various counterhypotheses to a parapsychical explanation are considered, including trickery, seismic disturbances, and effects from underground water, but the authors do not believe that these could explain satisfactorily all the effects observed in their presence.

ISTOMIN, I. Esperienze con Giuseppe A., il violinista (Experiments with Joseph A., the violinist). *Bollettino della Società Italiana di Parapsicologia,* 1960, **6**, 1-14.

Since 1956, members of the Italian S.P.R. have been experimenting with an apparently paranormally gifted subject, a middle-aged violinist who performs in restaurants and night-clubs. This subject is said to be able to "read" questions written on strips of paper after the strips have been repeatedly folded and while they are held in the experimenter's closed hand. Twelve experiments are described in which every attempt was made to eliminate possible sensory cues. (In several instances the strips of paper were glued down with adhesive tape.) All 12 experiments were more or less successful. The subject's written answers showed that though some scripts were apparently read directly and clairvoyantly, other reactions gave clear indications of GESP of events and conditions in some cases unknown to the sitter or writer of the script. One gets the impression that the target scripts, generally untouched by the subject, played the same role as Mrs. Piper's "influence" in bringing forth the subject's paranormal faculties.—*G. Zorab.*

MARSHALL, N. ESP and memory: a physical theory. *British J. Phil. Sci.,* 1960, **10**, 265-86.

In an attempt to integrate telepathy into modern physics, Marshall contends that what appear as indeterminate occurrences on the

quantum level in very complex structures such as the brain may actually be information produced by forces that have been overlooked by physicists up to now because of their concentration on very simplified structures. He proposes a "holistic" law to explain the existence of telepathy and memory in which the effects would be proportional to the complexity of the structure.

According to this "law of resonance," any two similar structures exert an influence on each other which tends to make them become more similar, even though they are separated in space and time. The change of pattern in neural activity produced by this influence would increase with the strength of the influence but also with the probability of the change as calculated by quantum mechanical laws. Resonance of a pattern in one brain with another would lead to telepathy, while resonance of a brain with a past state of itself would lead to memory.

In addition to a general application of this theory to neurophysiological and psychological processes, Marshall attempts to account for the relevant facts of telepathy, such as the erratic, unconscious, and often distorted nature of the telepathic information. If the brain resonates about equally with many other structures, there will be much loss and corruption of information, as probably happens in the majority of cases. In an ideal situation, one brain would resonate strongly with one other brain and weakly with all others, which would explain why some agents get results with a certain percipient and why there are frequent telepathic cases between relatives. Difficulties in abstracting telepathic information from the complex pattern of brain function in which it is embedded would be facilitated when emotionally-toned material was involved, because this would have a greater influence on the contents of consciousness and make discrimination easier.

Osis, K. Some explorations with dowsing. *J. Amer. Soc. psych. Res.*, 1960, **54**, 141-52.

Several brief exploratory projects are summarized which involved different types of dowsing techniques and seven different subjects. The author notes that trials made when the hidden target was

near gave results on a better-than-chance level, whereas long-distance trials gave no indication of other than chance scoring.

RHINE, J. B. On parapsychology and the nature of man. *Dimensions of Mind* (Sidney Hook, Editor). New York: New York University Press, 1960.

Parapsychological findings are discussed with reference to the question of what properties an organism must have to account for psi phenomena. The apparent absence of "psi-receptors or effectors," and even of any conscious clues of psi functioning as such, prevents control of success by means of introspection, and hence of the demonstration of psi on demand or its practical application as yet. The results of routine psi tests do seem to indicate, however, that a natural function of personality is involved. Psi seems to relate fairly consistently to certain psychological states and to exhibit some of the characteristics and pattern effects of more familiar cognitive behavior.

Perhaps the most distinctive and at present most significant feature of parapsychology is its failure to show any regular relationship with time, space, and mass, or with any other criteria of physical lawfulness. Actually, this distinction of nonphysicality is thought to be a transient point which will be superseded eventually by the exploration of the "common ground of nature." It is stressed now because "it is necessary in order to call the attention of science to the existence of another domain of nature that is now measurably and experimentally demonstrable as a distinctive territory."

RUSH, J. H. The rediscovery of mind. *The Humanist,* 1960, No. 3, 143-53.

The great advances in scientific conceptualization have come about, not because of new corollaries which fit in with prevailing beliefs, but because some new departure in thought or some findings which do not "make sense" challenge existing theory and initiate a fresh synthesis of data and ideas. Psi phenomena provide such a challenge to our current conception of the objective world. Their existence could never have been anticipated by reasoning from present

scientific concepts, yet innumerable spontaneous experiences and many careful experiments attest to their reality.

The author does not attempt to state the case for psi in this essay, although he is personally convinced of its reality. He does insist that to develop an informed judgment of the validity of this work, the same sort of effort must be made that is required to master the essential literature of any other specialized field. And no one who is interested in understanding human personality can afford to neglect it.

Psi phenomena may be defined as relations between the mind and its physical environment that are analogous to sensory experience (ESP) or motor activity (PK) but which occur apparently without sensorimotor mediation. All that is known about psi seems to relate it, not to the world of physical order and causality, but to the imprecise world of "subjective mind." Therefore the strategic approach and "imperative necessity" would be to examine these puzzling phenomena from the standpoint of the mind that experiences them, and specific suggestions along this line are proposed. In summary, the author notes that we should not look to physics for the explanation of psi, but instead we might expect that the elucidation of psi will aid in clarifying the relationships between human personality and the physical world.

SCHMEIDLER, G. R. Changing field relations of an ESP experiment. *Festschrift for Gardner Murphy* (J. G. Peatman and E. L. Hartley, Editors). New York: Harper and Bros., 1960.

A two-experiment project is reviewed to illustrate the effect on ESP success of changing the field conditions—in this case, the social relations between subjects and between subjects and experimenter. In the first experiment, the pairs to serve as "agent" and "percipient" were introduced before the experimenting and together decided who was to be the agent and who the percipient; whereas in the second experiment, the participants never met and were kept ignorant of each other's identity.

In the first experiment, highly successful predictions were made about how the pairs would score in the GESP condition on the basis of their Rorschach protocols; the difference between the total

scores of the predicted "success" and those of the predicted "failure" groups was quite significant ($P < .001$). In the second experiment, however, no relation was found between the experimenter's predictions and GESP scores in the success or failure groups.

A negative correlation of borderline significance ($P = .022$) was obtained in the first experiment between the GESP scores and scores when the "agent" did not look at the cards but was instructed to wish for the percipient's failure. A correlation in the same direction but of even less significance was obtained in the second experiment.

STEVENSON, I. A review and analysis of paranormal experiences connected with the sinking of the *Titanic*. *J. Amer. Soc. psych. Res.*, 1960, **54**, 153-71.

In analyzing a group of the twelve "most substantial" psi experiences associated with the sinking of the *Titanic*, the author notes that the cases differ greatly in a number of features, such as the psi form, the number of details perceived, the particular imagery by which the information was conveyed, and the extent of personal ties between percipient and the person involved in the calamity.

WOODRUFF, J. L. Effect on ESP scoring of a change in ESP material. *Festschrift for Gardner Murphy* (J. G. Peatman and E. L. Hartley, Editors). New York: Harper and Bros., 1960.

One aspect of a multivariable study of ESP which is reported separately here was an investigation of whether subjects would respond differently to color targets (red ESP symbols) that were randomly alternated, on a 40/60 ratio, among the regular black ESP symbols, with the subjects assuming that all the targets were black. No significant difference was found in the relative degree of success obtained on the two kinds of material, but a difference in scoring pattern was suggested by the differences in intersubject variation in scoring. A greater fluctuation from the mean characterized the responses to the unexpected red material (which had a summated chi square with a probability of 0.01) than was present with the black material of the test situation or of a previous control series when all the targets were black.

Extrasensory perception in school children. Parapsychological News Section, *Indian J. Parapsychol.*, 1960, 2, 38-40.

Statistically significant results ($P = .0027$) are reported in GESP tests conducted with six- to eight-year-old school girls and their teacher at the Government Girls College at Sri Ganganagar, Rajasthan, India. An experimental design similar to that of J. G. van Busschbach's classroom experiments was followed, with a teacher acting as sender and three groups of 20 girls acting as subjects. In the total of 1200 runs, 6208 hits were obtained where chance is 6000, which gives a critical ratio of 3.00.

THE PARAPSYCHOLOGICAL ASSOCIATION

The 1961 Council

Elections to the Council of the Parapsychological Association were held during November and December, 1960. The new Council consists of Dr. Karlis Osis, President; Dr. J. G. Pratt, Vice-President; Dr. Carroll B. Nash, Secretary; Miss Margaret Anderson, Treasurer; and three Councilmen: Dr. Gertrude R. Schmeidler, Dr. R. A. McConnell, and Miss Rhea White.

Miss White is Secretary of the Membership Committee. Persons desiring to join the Association should write to her at the American Society for Psychical Research, 880 Fifth Avenue, New York, N. Y.

At the close of 1960, the membership of the Association consisted of 54 Members, 76 Associates, and 5 Honorary Members.

The Fourth Annual Convention

The fourth annual convention of the Parapsychological Association will be held at the Henry Hudson Hotel, New York City, from Thursday, September 7, through Saturday, September 9, 1961. The Chairman of the Program Committee is Dr. Schmeidler and the Chairman of the Arrangements Committee, Miss White. Nonmembers who wish to attend the Convention should communicate with Miss White. Members and Associates will receive convention information and registration forms through the mail.

Persons planning to contribute papers, research briefs, or arrange symposia are reminded of the April 1 time limit and advised to study the *Call for Papers* in the December, 1960, issue of this *Journal.*

GLOSSARY

A description of the basic experimental methods, of the findings, and of the statistical procedures for evaluating ESP and PK results may be found in *Parapsychology, Frontier Science of the Mind* by J. B. Rhine and J. G. Pratt (published by Charles C. Thomas, Springfield, Illinois, U.S.A., Blackwell Scientific Publications, Ltd., Oxford, England, and The Ryerson Press, Toronto, Canada).

AGENT: The "sender" in tests for telepathy, the person whose mental states are to be apprehended by the percipient. In GESP tests, the person who looks at the stimulus object.

BT (Basic Technique): The clairvoyance technique in which each card is laid aside by the experimenter as it is called by the subject. The check-up is made at the end of the run.

CALL: The ESP symbol selected by the subject in trying to identify a target.

CHANCE: The complex of undefined causal factors irrelevant to the purpose at hand.

Chance Expectation = Mean Chance Expectation: The most likely score if only chance variation is present.

Chance Average: Mean chance expectation expressed as an expected score, generally in terms of average per run.

CHI SQUARE: A sum of quantities each of which is a deviation squared divided by an expected value. Also a sum of the squares of CR's.

CLAIRVOYANCE: Extrasensory perception of objective events as distinguished from telepathic cognition of the mental activities of another person.

CR (Critical Ratio): A measure to determine whether or not the observed deviation is significantly greater than the expected random fluctuation about the average. The CR is obtained by dividing the observed deviation by the standard deviation. (The probability of a given CR may be obtained by consulting tables of the probability integral, such as Pearsons.)

CR_d (Critical Ratio of the Difference): The observed difference between the average scores of two samples of data divided by the standard deviation of the difference.

DEVIATION: The amount an observed number of hits or an average score varies from the mean chance expectation or chance average. A deviation may be total (for a series of runs) or average (per run).

DISPLACEMENT: ESP responses to targets other than those for which the calls were intended.

Backward Displacement: ESP responses to targets preceding the intended targets. Displacement to the targets one, two, three, etc. places preceding the intended target are designated as (−1), (−2), (−3), etc.

Forward Displacement: ESP responses to targets coming later than the intended targets. Displacement to the targets one, two, three, etc. places after the intended target are designated as (+1), (+2), (+3), etc.

DT (Down Through): The clairvoyance technique in which the cards are called down through the pack before any are removed or checked.

ESP (Extrasensory Perception): Awareness of or response to an external event or influence not apprehended by sensory means.

ESP CARDS: Cards, each bearing one of the following five symbols: star, circle, square, cross and waves (three parallel wavy lines).

ESP PACK: Twenty-five ESP cards.

Closed Pack: An ESP pack composed of five each of the five symbols.

Open Pack: An ESP pack made up of the ESP symbols selected in random order.

EXPECTATION: See *Chance.*

EXTRACHANCE: Not due to chance alone.

FREE MATERIAL: The stimulus objects of experiments in which an unlimited or unspecified range of stimulus objects is employed (as contrasted with methods such as card-calling in which the subject knows that the stimulus object is one of a known range).

GESP (General Extrasensory Perception): A technique designed to test the occurrence of extrasensory perception, permitting either telepathy or clairvoyance or both to operate.

MCE (Mean Chance Expectation): see *Chance.*

P (Probability): A mathematical estimate of the expected relative frequency of a given event if chance alone were operative.

PARANORMAL: Parapsychical or parapsychological.

PARAPSYCHOLOGY: A division of psychology dealing with behavioral or personal effects which do not fall within the scope of physical principles.

PERCIPIENT: See *Subject.*

PK (Psychokinesis): The direct influence exerted on a physical system by a subject without any known intermediate physical energy or instrumentation.

PLACEMENT TEST: A PK technique in which the aim of the subject is to try to influence falling objects to come to rest in a designated part of the throwing surface.

PRECOGNITION: Cognition of a future event which could not be known through rational inference.

PREFERENTIAL MATCHING: A method of scoring responses to free material. A judge ranks the stimulus objects (usually pictures in sets of four) with respect to their similarity to, or association with, each response; and/or he ranks the responses with respect to their similarity to, or association with, each stimulus object.

PSI: A general term to identify personal factors or processes which are non-physical in nature. It approximates the popular use of the word "psychic" and the technical one, "parapsychical."

PSI-MISSING: Exercise of psi ability in a way that avoids the target the subject is attempting to hit.

PSI PHENOMENA: Occurrences which result from the operation of psi. They include the phenomena of both ESP (including precognition) and PK.

PSYCHICAL RESEARCH: Older term used for parapsychology.

QD (Quarter Distribution): The distribution of hits in the record page (or in a logical subdivision thereof, such as the set or the half-set) as found in the four equal quarters formed by dividing the selected unit horizontally and vertically.

RANDOM ORDER: An order of events which displays no trends or regularities that would allow any inference regarding one event from one or more of the others in the series.

RUN: A group of trials, usually the successive calling of a deck of 25 ESP cards or symbols. In PK tests, 24 single die throws regardless of the number of dice thrown at the same time.

SCORE: The number of hits made in any given unit of trials.
Total Score: Total of scores made in a given number of runs.
Average Score: Total score divided by number of runs.

SD (Standard Deviation): Usually the theoretical root mean square of the deviations. It is obtained from the formula $\sqrt{npq}$ in which n is the number of single trials, p the probability of success per trial, and q the probability of failure.

SERIES: Several runs or experimental sessions that are grouped in accordance with a stated principle.

SESSION: A unit of an ESP or PK experiment comprising all the trials of one test occasion.

SET: A subdivision of the record page serving as a scoring unit for a consecutive group of trials, usually for the same target.

SIGNIFICANCE: A numerical result is significant when it equals or surpasses some criterion of degree of chance improbability. The criterion commonly used in parapsychology today is a probability value of .01 or less, or a deviation in either direction such that the CR is 2.58 or greater.

SINGLES TEST: A PK technique in which the aim of the subject is to try to influence dice to fall with a specified face up.

SPONTANEOUS PSI EXPERIENCE: Natural, unplanned, occurrence of an event or experience that seems to involve parapsychical ability.

STIMULUS OBJECT: The ESP card or drawing or other object, some identifying characteristic of which is to be apprehended by the percipient.

STM (Screened Touch Matching): An ESP card test in which the subject indicates in each trial (by pointing to one of five key positions) what he thinks the top card is in the inverted pack held by the experimenter behind a screen. The card is then laid opposite that position.

SUBJECT: The person who is experimented upon. In ESP tests, most commonly the percipient (though also the agent in GESP and telepathy). In PK tests, any individual whose task it is to influence the objects thrown.

TARGET: In ESP (including precognition) the objective or mental events the subject is attempting to respond to. In PK tests, the faces of the die which the subject attempts to bring up in the act of throwing. In placement tests, the designated part of the throwing surface.

Target Card: The card which the percipient is attempting to identify or otherwise indicate a knowledge of.

Target Pack: The pack of cards the order of which the subject is attempting to identify.

Target Face: The face on the die which the subject tries to turn up by PK.

TELEPATHY: Extrasensory perception of the mental activities of another person (as distinguished from clairvoyant cognition of objective events).

TRIAL: In ESP tests, a single attempt to identify a stimulus object. In PK tests, a single throw of the dice or other objects thrown.